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DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION

Prepared By

STATE OF MONTANA
DEPARTMENT OF HIGHWAYS

FINAL
ENVIRONMENTAL STATEMENT

ADMINISTRATIVE ACTION

PROJECT F-20(1)
U.S. 191 SPUR



THIS HIGHWAY IMPROVEMENT IS PROPOSED FOR FUNDING UNDER TITLE 23, U.S.C. THIS STATEMENT FOR THE IMPROVEMENT WAS DEVELOPED IN CONSULTATION WITH THE FEDERAL HIGHWAY ADMINISTRATION AND IS SUBMITTED PURSUANT TO: SECTION 102(2)(C) - PUBLIC LAW 91-190

H.J. ANDERSON, DIRECTOR OF HIGHWAYS

BY

Jack R. Roberts
ADMINISTRATOR

ENGINEERING DIVISION

Date

7-31-72

REVIEWED FOR CONTENT AND ACCEPTED BY
THE FEDERAL HIGHWAY ADMINISTRATION

Date

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FEDERAL HIGHWAY ADMINISTRATION
REGIONAL ADMINISTRATOR

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INTRODUCTION

The purpose of this statement is to assure that the human environment is carefully considered and national environmental goals are met when developing federally financed highway improvements.

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SUMMARY SHEET

I. TYPE OF ACTION

<input checked="" type="checkbox"/> Administrative	<input type="checkbox"/> Legislative
<input type="checkbox"/> Draft	<input checked="" type="checkbox"/> Final
<input checked="" type="checkbox"/> Environmental Statement	
<input type="checkbox"/> Combination Environmental/Section 4(f) Statement	

II. PROJECT DESCRIPTION

The project begins on U.S. 191 near the mouth of the West Fork of the West Gallatin River about midway between Bozeman and West Yellowstone, Montana. It extends up the West Fork drainage a distance of 9.7± miles, to a point near the base of Lone Mountain and very near the divide between the Gallatin and Madison Rivers. The project is a federal-aid primary spur to federal-aid Primary Route 50. It is located in Gallatin and Madison Counties. Exhibits A and B show the location of the project.

III. ENVIRONMENTAL IMPACTS

The project will provide a fast, safe and efficient transportation facility for the traveling public. It will enable them to reach a newly developed recreational area for both recreational and employment opportunities. The area being served is the site of a multimillion dollar year-round resort complex being built by Big Sky of Montana, Inc.

The economic impact of this development will be felt by a large area of southwestern Montana. Gallatin and Madison Counties will share in a substantially larger tax base. Restaurants, gas stations, hotels and motels, airlines and other tourist oriented businesses will benefit. Employment at Big Sky will provide approximately 300 jobs.

The West Fork of the West Gallatin River, where the project is located, has in the past been an undeveloped area used primarily for timber harvesting, dude ranching, cattle ranching and limited recreational activities. The changing land use in the area represents a major environmental consideration. The change in land use is underway at the present time and is not being caused by the proposed highway construction. The highway project will, however, complement and act as a catalyst to this change. The construction of this project will put this greatly intensified use of the area on a modern highway facility rather than the existing low class logging road or some modification of it.

During construction and for a short period of time after construction, there will be an increase in air and water pollution caused by the construction activity. The contractor will be required to meet state air pollution standards and temporary erosion control methods, topsoil replacement and seeding will be included in the contract in order to keep air and water pollution to a minimum.

Some minor adjustments may occur in the behavior of wildlife species. Although a wide variety of wildlife inhabit the area, it is not an important winter range or the exclusive habitat of any of these species. Most of the wildlife will stay in the area with only minor adjustments in their behavior.

Agencies and organizations reviewing this statement are referred to the U.S. Forest Service Final Environmental Statement on the Gallatin Exchange Numbers 2 and 3 for a fuller discussion of the overall environmental impact of the entire Big Sky Development, including the original highway planning.

IV. ALTERNATIVES

A study of five alternate alignments has been made for a portion of the project. Deviation from the existing roadway corridor at this location is necessitated by an active landslide. The environmental impacts of the alternates do not vary greatly. The study is concerned more with the engineering aspects of establishing an alignment that will reach the desired elevation with a reasonable grade. In addition to grade, the selection of the best alternate must consider cost, horizontal curvature, cut and fill scars and the geological problems encountered.

The "do-nothing" alternative may have appeal to the group of people who would prefer that Big Sky not be built.

However, not building the road would not insure that Big Sky would not be built, as the lower village complex is already under construction. It could be more harmful to the environment to have traffic using a substandard roadway than to have a highway built to modern standards with proper provision made for drainage and erosion control.

V. DISTRIBUTION OF DRAFT STATEMENT

A. FEDERAL, STATE AND LOCAL AGENCIES AND OTHER ORGANIZATIONS
FROM WHICH COMMENTS WERE REQUESTED BUT NOT RECEIVED:

Director, Department of Natural Resources
and Conservation
Attention: Lawrence M. Jakub
Sam W. Mitchell Building
Helena, Montana 59601

Center for Planning and Development (Provided Appendix C)
Montana State University
Bozeman, Montana 59715

Economic Development Administration
Chicago Title Building
909 17th Street
Suite 505
Denver, Colorado 80202

Weather Bureau
P.O. Box 11188, Federal Building
125 South State Street
Salt Lake City, Utah 84111

Office of Civil Defense
Federal Regional Center
Bothell, Washington 98011

Federal Water Quality Administration
Northwest Region
Room 501, Pittock Block
Portland, Oregon 97205

Board of County Commissioners
Gallatin County Courthouse
Bozeman, Montana 59074

School Board
District #72
Gallatin Gateway, Montana 59730

Agricultural Stabilization & Research Service
112 West 13th Avenue
Helena, Montana 59061

U.S. Forest Service (Comments submitted by Region 1 U.S.F.S.)
Gallatin National Forest
Federal Building
Bozeman, Montana 59715

(Continued)

School Board District #7
Bozeman, Montana 59715

Mr. Donald Aldrich
Executive Secretary
Montana Wildlife Federation
410 Woodworth Avenue
Missoula, Montana 59801

B. FEDERAL, STATE AND LOCAL AGENCIES AND OTHER ORGANIZATIONS
FROM WHICH COMMENTS WERE RECEIVED (Comments are numbered
in the order in which they appear in Appendix A):

- Ltr. #1 Assistant Secretary - Program Policy
 Attention: Director, Environmental Project Review
 Department of the Interior
 Washington, D.C. 20240 (9 copies)
- Ltr. #2 Fletcher E. Newby, Executive Director
 Environmental Quality Council
 Capitol Station
 Helena, Montana 59601 (2 copies)
- Ltr. #3 Robert Rosenheim, Regional Administrator
 Department of Housing and Urban Development
 Denver Regional Office
 Federal Office Building
 19th and Stout Streets
 Denver, Colorado 80202
 Attention: Eldon Halingstad
 Environmental Clearing Officer
- Ltr. #4 Environmental Protection Agency
 Room 916, Lincoln Tower
 1860 Lincoln Street
 Denver, Colorado 80203 (5 copies)
- Ltr. #5 Mr. Harry H. Grant, Executive Director
 Inter-County Development Corporation of
 Southwestern Montana
 P.O. Box 1179
 Anaconda, Montana 59711
- Ltr. #6 Mr. Walter H. Myers, Chairman
 Madison County O.E.D.P. Committee
 Virginia City, Montana 59755
- Ltr. #7 Big Sky of Montana, Inc.
 P.O. Box 80
 Gallatin Gateway, Montana 59730
- Ltr. #8 U.S. Forest Service
 Northern Region
 Federal Building
 Missoula, Montana 59801

(Continued)

- Ltr. #9 Corps of Engineers
Missouri River Division
Division Engineer
U.S. Army Engineer Division,
Missouri River
P.O. Box 10 (Downtown Station)
Omaha, Nebraska 68101
- Ltr. #10 Department of Health, Education and Welfare
9017 Federal Office Building
19th and Stout Street
Denver, Colorado 80202
- Ltr. #11 Director
Montana Fish and Game Department
Helena, Montana 59601
- Ltr. #12 Montana Aeronautics Commission
P.O. Box 1698
Helena, Montana 59601
- Ltr. #13 Director
State Department of Health
Helena, Montana 59601
- Ltr. #14 Board of County Commissioners
Madison County Courthouse
Virginia City, Montana 59755
- Ltr. #15 Department of Planning & Economic Development
Capitol Post Office
Helena, Montana 59601
- Ltr. #16 Dr. T.C. Byerly
Office of Secretary of Agriculture
Washington, D.C. 98109
(Answer from Soil Conservation Service-Bozeman, Montana)
- Ltr. #17 Mr. Perry H. Nelson, Chairman
Natural Resources Committee
Gallatin Sportsman's Association
526 North Bozeman
Bozeman, Montana 59715
- Ltr. #18 Mr. Albert G. Melcher
Director of Field Services
Rocky Mountain Center on Environment
4260 East Evans Avenue
Denver, Colorado 80222

C. OTHERS WHO SUBMITTED COMMENTS (Comments are numbered in the order in which they appear in Appendix A):

Ltr. #19 Burlington Northern Inc.
6 N. Wallace Avenue
Bozeman, Montana 59715

Ltr. #20 Ms. Dorothy Bradley
State Representative
Box 268, Route 2
Bozeman, Montana 59715

Ltr. #21 Cliff Montagne
Box 265, Rt. 2
Bozeman, Montana 59715

VI. DATE DRAFT STATEMENT AVAILABLE TO C.E.Q.: February 29, 1972

ENVIRONMENTAL STATEMENT

I. DESCRIPTION OF THE PROPOSED HIGHWAY IMPROVEMENT AND ITS SURROUNDINGS

A. PROJECT DESCRIPTION

The project is located in Gallatin and Madison Counties in southwestern Montana. It begins on U.S. 191 near the mouth of the West Fork of the West Gallatin River about midway between Bozeman and West Yellowstone. It extends up the West Fork drainage a distance of 9.7+ miles, to a point near the base of Lone Mountain, very near the divide between the Gallatin and Madison Rivers.

The new roadway will provide a 34-foot paved surface with 2-12 foot driving lanes and 2-5 foot shoulders. Inslopes will have 6:1 safety slopes with a minimum ditch width of 15 feet. Cut and fill slopes will vary according to their height and the type of material encountered.

Drainage structures will be provided based on hydrologic and hydraulic studies. Except for the West Fork, the streams involved are not large enough to require bridge structures. Minor channel adjustments will be required at culvert ends.

Design standards for the project will be in accordance with the State of Montana, Department of Highways' Design Standards for Primary and Secondary Highways. Maximum grades of 7% and maximum horizontal curvature of $12^{\circ}30'$ will be used in the design. Minimum right-of-way width will be 80 feet on each side of centerline.

Where physical or environmental conditions indicate that exceptions to the standards are in the best interest of total design, grades in excess of 7% and curvature sharper than $12^{\circ}30'$ may be utilized.

The design year average daily traffic is 1400 vehicles per day. The estimated new winter trips generated two years after completion of the road is 443 vehicles per day.

B. PROJECT HISTORY

Upon retirement from NBC, former newscaster, Chet Huntley, announced the proposed development of Big Sky of Montana, a year-round resort complex to be built on the West Fork of the West Gallatin River. Amid considerable controversy over the environmental impact of the development, construction is now underway on a golf course, condominiums, a visitor center and other facilities. Also, an existing guest ranch was remodeled in 1971. To date, construction has been primarily in the Meadow Village area with building construction at the Mountain Village area having been postponed pending the outcome of a land exchange involving the U.S. Forest

Service and Burlington Northern Inc. The land exchange has recently been completed and construction of the Mountain Village can now proceed.

With the construction of a large recreational complex such as Big Sky comes the need for improved transportation facilities. The proposed project will provide the necessary all-weather highway access to Big Sky.

Construction contracts were awarded in July, 1971 for construction of a structure across the West Fork and 3 miles of gravel surfaced roadway from U.S. 191 to the Meadow Village area. No federal money was used for this construction. This section of roadway is being built to standards comparable to the standards being used on the remainder of the project. It is anticipated that contracts for the upper 6.7⁺ miles will be awarded in 1973.

On April 30, 1971, the Department of Highways made application to the Federal Highway Administration for designation of a Federal-Aid Primary Spur to serve this area. On August 20, 1971, the spur was approved. This will allow future contracts to be built as part of the Montana Federal-Aid Primary System.

On August 12, 1971, application was also made to the Federal Highway Administration for designation of an Economic Growth Center in the West Fork drainage.

This application was approved on November 2, 1971, thereby making the federal-aid matching ratio 20% higher than on normal federal-aid primary projects.

Montana State University is conducting a 3-year study entitled "The Impact of a Large Recreational Development upon a Semi-Primitive Environment: A Case Study". This project is being funded by the National Science Foundation. This study will document the effects this development has on the area and will provide a planning guide for future developments elsewhere in the state or nation. The latest report on their study is included as Appendix C

The U.S. Forest Service prepared an Environmental Statement in conjunction with their proposed land exchanges with Burlington Northern Inc. Their Final Environmental Statement, dated July 1, 1971, provides a fuller discussion of the overall impact of the entire Big Sky Development.

This statement will make use of these publications and other correspondence and reports where the items being discussed are pertinent.

C. DESCRIPTION OF EXISTING PROJECT ENVIRONMENT

1. Land Use

Until recently, the West Fork had been used primarily for grazing and timber harvesting. A limited amount of recreational activity and a few

summer homes also existed. With the development of the Big Sky Project, the land use will become primarily recreational.

Big Sky of Montana, Inc. plans to develop and operate a major resort complex. They will add skiing, golf, tennis, swimming and other sports to the presently available hunting, hiking, camping, and horseback riding. In the West Fork drainage those recreational pursuits that are associated with an isolated and most uninhabited area may decline in importance because of the pressure from the more concentrated sports.

Big Sky is also a land development corporation and as such will be marketing home sites and condominiums. The facilities to be developed will be open to the general public and use of the area will be primarily by the general public as well as use by those who have purchased property at Big Sky.

Of the land owned by Big Sky, development is planned for 1,145 acres, 1,205 acres are reserved for future expansion and 8,298 acres are to remain untouched except for reforestation and seeding.

Montana State University and U.S.D.A., Soil Conservation Service scientists have compiled a General Soils Map and Soil Interpretation for Land Use Planning and Development in the Gallatin Canyon Area. This map shows soil classifications and

limitations for various land uses. The project will pass over soil associations with moderate to severe limitations for roads and parking based on excessive slope, susceptibility to frost heave and shallow depth to bedrock. This map is available from the Montana Agricultural Experiment Station, Montana State University, Bozeman, Montana.

2. Terrain

The project is located in the mountains of southwestern Montana. It is within the boundaries of the Gallatin National Forest and about 50 miles north of Yellowstone National Park. Immediately to the north lies the Spanish Peaks Primitive Area. The surrounding mountains are a part of the Madison Mountain Range. Lone Mountain is the dominant physical characteristic as it stands by itself when viewed from the Gallatin River at the mouth of the West Fork.

The West Fork drainage contains open meadows in its lower reaches and timber covered ridges at higher elevations. The West Fork branches into the South Fork, the Middle Fork and the North Fork, with these streams being fed by smaller tributaries. Ulyers Lakes lie on the Madison side of the divide, about $\frac{1}{2}$ mile from the upper village site. Although only 6 to 7 acres in size, these high mountain lakes are quite scenic and provide an excellent rainbow trout fishery.

3. Geology

The predominant rock types in the West Fork Basin are shales and sandstones of the Colorado Formation. These are overlain by glacial tills and alluvial deposits ranging in depth to 50 feet.

In conjunction with the National Science Foundation, Montana State University scientists have made soils and geological studies of the area. Their preliminary report of April 1971, "The Impact of a Large Recreational Development upon a Semi-Primitive Environment: A Case Study", states "Systematic study of the geological factors bearing on future development in the West Fork Basin has revealed that selective methods of procedure will be most beneficial where construction is concerned. For instance, certain rock types may be considered particularly fragile in an environmental sense. Of these, the worst behavior is the black shale and sandstone sequence of Cretaceous age which occupies more surface area in the West Fork Basin than any other rock type. Since the shale possesses the most critical limitations insofar as weight-bearing capacity, slope stability and water passing ability are concerned, it alone dominates the scene when considering dams, highways, heavy building and water development or disposal facilities.

"Gravels which have been spread either from the fronts of glaciers, or by streams in the usual course of flood plain development, thinly blanket the above mentioned shale and sandstone sequence in the basin flats. In no case have we discovered thicknesses exceeding 50 feet; most of the gravel sheet is about 30 feet in thickness. The rapid discharge of any waste water through most of these gravels will result in rapid transmittal of that water to the top of the underlying black shale stratum, at which plane water will tend to be concentrated and run off toward the lower basin areas, eventually discharging directly into the ground water system, but particularly into the direct stream of the Gallatin River and its tributaries. It is advisable, therefore, that waste water discharged into the gravels be relatively free of contamination.

"Landslide-prone formations in this area present a challenge to all construction planning. The landscape is literally dominated in the sloping areas by stabilized landslides which ran, probably slowly, in response to various climatic influences and glacial oversteeping during the past few hundred thousand years. If these landslides are intercepted for roadways, foundations and other construction, it can

be expected that the tenuous equilibrium under which they have been stabilized will be upset and further movement will result. Proper drainage, proper slope in highway cuts, compensating backfill and other engineering procedures will minimize such disturbance and save money in the long run.

"Within the past thousand years, in the alpine and subalpine zones of the West Fork Basin, so-called rock glaciers have continued to move large masses of rubble to lower elevations. These slowly moving streams of rock, some of which are a quarter of a mile wide and a half mile long, have had a core of ice in the past comparable to glacial ice. Although the origin of this ice is attributable to a variety of alpine conditions, it is not precisely understood which of these prevailed at this particular location in the recent past. Further, it is predictable that certain ice-cored rock streams or 'rock glaciers' may yet be active on the east flank of Lone Mountain where evidence of recent movement can be observed. In addition to the possibility that the ice, if any, would be a source of springs emanating from the volcanic rubble at the base of the Upper Village site in Section 30, such ice would also cause instability if manmade facilities are installed within its domain. Exploratory excavation into the

rubble by bull-dozing should reveal whether or not such ice cores are present and therefore may dictate what kinds of structures can be tolerated.

"In 1959, severe earthquakes resulted from sudden movement along two major faults in the vicinity of Lake Hebgen a few miles south and west of West Fork. Heavy damage was sustained in the immediate area of Hebgen Lake. While the entire region was severely shaken, no damage was reported from West Fork. However, this event plus the evidence of fault movements in the West Fork area in the relatively recent geological past, point to the clear need to consider all land use planning and construction from an earthquake hazard point of view. Of particular importance is recognition of the extreme hazard to permanent buildings or visitor sites located beneath rock cliffs, or near or on former landslide movements. The size of reservoirs should be kept to the minimum consistent with flooding should landslides displace water or breach the dams.

"Esthetically, the rich geological history of this area, including the great episodes of sea flooding, the development of the Spanish Peaks along a dominant compressive fault line that runs through the West Fork and provides the structural

setting for this basin, the volcanic episodes which showered ash and lava, and finally the glacial epoch in which giant streams of ice descended all major streams to the lower village site with resulting disruption of all previous topographic and geologic expression, -- these are to be documented and will become part of the record of interesting natural features to be interpreted for the public interest."

4. Climate

The Water Resources Survey, Gallatin County, Montana, published by the State Engineer's Office and dated January, 1953 states, with regard to the climate of Gallatin County, "As is the case with most counties in the southwestern part of Montana, topography plays a very important part in the climate of Gallatin County. In general, the mountainous sections are both wetter and cooler than the fairly broad valley floors of the northern half. In the southern half, which is quite mountainous, January has the largest precipitation normally, but there is a secondary peak in June. In the northern valleys the wettest months normally are May and June, with a secondary maximum in September. Abundant snowfall during most winters assures a quite dependable supply of water for valley irrigation during

the growing season. The spring, season is usually fairly cool and cloudy, with frequent periods of either showers or general rain.

"Several periods of warm days with plenty of sunshine in the late summer and early fall are ideal for maturing crops and harvesting. Thunderstorms sometimes accompanied by hail are frequent from June through August. While hail can occasionally cause damage, widespread or severe damage is rare. Strong winds are sometimes observed in exposed areas, but Gallatin County is not known as one of the windy sections of Montana. Tornadoes are practically unknown."

Weather records indicate a high reading of 112^o at Bozeman and a low of -66^o at West Yellowstone.

5. Population

The permanent population of the area will show some growth in future years. The Department of Planning and Economic Development in their Environmental Impact Statement of March 22, 1971, states, "The permanent population in the area purchased by Big Sky has been three persons for the last number of years. If the area is developed per the Big Sky master plan, the permanent population will increase, especially at the Meadow Village. Big Sky's estimated employment at 300 persons may be composed of

150 commuters and 150 local residents. Of the 150 resident employees, one third or 50 persons may represent families living on Big Sky's land. These 50 families at two and one-half persons per family represent 125 persons which, together with the single employees, equals approximately 225 persons or population. In addition to the permanent population which will be generated from the resort employment, there will be condominiums and second homes built in the area. The condominium development and second home development will take place in both the Mountain and Meadow Villages. Some permanent population will develop, but the transient tourist population will be the overriding population impact upon the area. This population may vary in the 1980's from 3,000 to a peak of 6,000 persons during the Christmas holidays or at spring break."

6. Economic Activity

The economic base of the Gallatin Canyon is dependent primarily on ranching, logging and recreation. No increase is anticipated in ranching and logging activity; however, a significant growth is foreseen in winter recreation. This will provide a better balance in the economy of the area.

The Montana State University preliminary report of April, 1971, "The Impact of a Large Recreational

Development Upon a Semi-Primitive Environment: A Case Study", states: "A survey of the businesses in the Gallatin Canyon, between Spanish Creek and the Grayling Creek Divide, was made during the summer of 1970. There are 10 business establishments, of which 5 are strictly 'guest ranches'. The other 5 are combinations of cabins, cafes, bars, gasoline and other minor services. One had space for campers and trailers.

"Together, the businesses employ a total of about 85 people during the peak two months, using mostly local help and college students.

"The total sleeping accommodations are about 350, including about 200 at guest ranches. Cafe capacity, other than the guest ranches, is about 150 people. The accommodations for special meetings are few and small.

"Annual volume of business for those reporting was less than \$100,000 per business.

"Guest ranches generally operate at capacity and so do not expect much impact directly on their business from Big Sky. Other businesses expect a positive impact.

"Data has been collected on bank debits and deposits; number and wages earned by the labor force in Gallatin County; vehicle assessments (truck and

automobiles); Montana Power Company electrical installations, service attachments, etc.; and Mountain States Telephone service connections (commercial and private). Additional indicators of business impact will be obtained and analyzed, including the sizes, kinds and number of businesses in Bozeman, Belgrade, Manhattan and Three Forks. Data is being gathered for enough years to give some indication of past trends which then can be used to project the baselines in the absence of the Big Sky resort development. Although analysis of data has not yet been completed, there is a definite increase in all types of business activity as measured by the above indicators."

7. Fish and Wildlife

The project area is inhabited by deer, elk, moose, big horn sheep, bear and many smaller species of wildlife. Streams such as the West Fork and its tributaries are populated primarily by rainbow and native cutthroat trout. Ulerys Lakes also provide an excellent rainbow trout fishery. Improved access and more intense land use in the area will have an effect on these fish and wildlife resources.

The Gallatin National Forest Final Environmental Statement, Gallatin Exchanges Nos. 2 and 3 states, "The Big Sky project will have an effect on wildlife, both animal and fisheries. The Montana Fish and

Game Department has stated, 'From a wildlife habitat aspect, a better site for this development could not have been selected. It is an area only lightly used by wildlife populations and contains no critical winter range areas that we are aware of. In fact, it is possible that upon the completion of the land and water development and the general change from a logging - livestock area into a recreational area, that the net effect will be a benefit to fish and wildlife populations'."

8. Highway Facilities

In the past, the West Fork drainage has been served by a system of county and Forest Service roads. This system provided the necessary access for ranching, timber harvesting, fire protection and recreation. They were, however, narrow and poorly maintained, with little or no surfacing and inadequate provision for dissipation of storm runoff.

The development of a large recreational complex in the area requires that an all-weather highway facility be constructed to accommodate the traffic that will be generated.

An increase in traffic volume is also anticipated on U.S. 191 in the Gallatin Canyon. The 1969 ADT (Average Daily Traffic) on this section varies from 1299 near Gallatin Gateway to 665 for the segment

within Yellowstone National Park. Without the Big Sky development, these figures project to 2250 and 1150, respectively, for the year 1992. It is anticipated that Big Sky will add 800 ADT to these figures, bringing the 1992 ADT to 3050 and 1950. Traffic volumes in this range can be handled adequately on a two-lane facility. Based on the above, it is assumed that no major reconstruction of U.S. 191 will be required.

9. Vegetation

The project area contains a combination of timbered areas and grassy park openings. The timber is mainly lodgepole pine with lesser amounts of Douglas fir and Englemann spruce. Alpine fir and whitebark pine are found at higher elevations. Some areas have been logged by either clear cutting or selective removal.

The open areas contain a wide variety of shrubs, grasses and mountain flowers. These areas have been used for livestock grazing in the past.

The change in land use, from timber production and livestock grazing to primarily recreation, should benefit the vegetative resources of the area.

II. PROBABLE IMPACT OF THE PROPOSED PROJECT

A. BROAD IMPACTS

The impact of this project is not so much a question of its own impact as it is one of the impact of what the

project serves. A resort the size of Big Sky is a first in the State of Montana, although similar developments have been built in other states.

Big Sky will bring a multimillion dollar resort complex, thousands of people and a new importance to an area that previously was virtually uninhabited by man.

The economic impact will be felt by a large area of southwestern Montana. Gallatin and Madison Counties will share in a substantially larger tax base. Restaurants, gas stations, hotels and motels, airlines and other tourist oriented businesses will benefit. Employment at Big Sky will provide approximately 300 jobs.

The condominiums and homesites will provide a place for people from urban areas to visit for a few days or weeks, or, for some, a place to make a permanent home. This project will not solve the problem of increasing urbanization but it will, in a small way, assist in reversing the rural-to-urban migratory trend by providing new economic opportunities and quality living in a basically rural, outdoor setting.

There is a possibility that this highway may eventually be extended into the Madison Valley and connect with U.S. 287 near Ennis. Extension of the route has not been proposed by the Montana Highway Commission, although public sentiment has been expressed supporting this possibility. There has also been opposition to this idea.

The environmental impact of such an extension would be considerably greater than that envisioned for the Spur coming in from the Gallatin. The route would, for the most part, cross forest land not presently accessible by motor vehicle. No attempt will be made in this environmental statement to evaluate the feasibility or environmental impact of this extension. A separate study and environmental statement would be required prior to any decision with regard to this possibility.

B. IMPACTS ON THE NARROW BAND ADJACENT TO THE PROJECT

This project will have an effect on the area immediately adjacent to the roadway, both during and after construction.

Approximately 150 acres of land will be required for the road project. All right-of-way for the project crosses private land and no public lands will be taken. Clearing and grubbing will be confined to that area actually required for construction and native vegetation will remain in other areas.

Stream crossings will require the installation of pipe culverts which will result in temporary disruption of the stream channel. Channel changes will be confined to minor modifications at the inlets and outlets of the culverts.

Where borrow, surfacing material or riprap must be acquired from outside the project limits, the contractor

will be required to submit a reclamation plan in accordance with the Montana Mined Land Reclamation Act. These material sources must be shaped, drained, topsoiled and seeded to return them to beneficial use.

The process of constructing a highway results in a temporary increase in air and water pollution. Contractors will be required to meet state air pollution standards with regard to dust control and air pollution control in order to keep air pollution to a minimum. Temporary and permanent erosion control methods and topsoil replacement and seeding will be employed.

State of Montana, Department of Highways Standard Specifications, Supplemental Specifications and Special Provisions provide specific instructions that the contractor must follow in meeting pollution control requirements.

Prior to the start of construction, the contractor is required to submit his schedules and methods of accomplishing temporary and permanent erosion control work for clearing and grubbing, grading, bridges and other structures at watercourses, construction, paving, haul roads, borrow areas and his plan for disposal of waste materials.

The contractor shall provide immediate erosion control measures to prevent contamination of adjacent streams or other watercourses, lakes, ponds or other

areas of water impoundment. Such work may involve the construction of permanent or temporary berms, dikes, dams, sediment basins, slope drains and/or use of mulches, mats, seeding or other control devices or methods necessary to control erosion.

Borrow areas will be shaped, topsoiled and seeded so as to present a pleasing appearance and to prevent erosion.

Disposal of debris from clearing and grubbing operations may be handled in one of a number of ways. The past practice of piling and burning debris is no longer acceptable on Montana Department of Highways' projects. Currently, alternate methods are being tried on various projects around the state.

Chipping was used on the lower 3 mile project with the resulting wood chips being spread on the slopes for mulch and to control erosion.

Burying debris in or below the roadway fill has been tried on some projects.

High heat intensity burning utilizing burning hoppers and forced air fans has also been used.

These new methods are being tested under field conditions. All have revealed problem areas, however, as experience is gained and as highway contractors develop the necessary equipment, these methods will be refined.

Noise levels during and after construction will be

higher than at present, although logging activity in the past represented noise levels of a similar magnitude. Due to the anticipated volumes and low percentage of trucks associated with a spur route, this will be a "Low Noise Level Highway" as outlined in the advance copy of PPM 90-2.

Some adjustments in the patterns and behavior of wildlife in the area can be expected. Although not as important as some other areas in the Gallatin, the West Fork does support a variety of wildlife species. Their adjustments will vary, with some species avoiding the area and others being attracted to it for one reason or another.

Increased "road kills" of wildlife, particularly deer, can be expected due to increased traffic volume and vehicular speed. Proper signing will be installed to warn motorists of deer crossings if this is found to be a problem.

Localized fluctuations in the water table can be expected in areas immediately adjacent to the roadway construction. Portions of the project area have a very high water table and where this condition exists, it may be necessary to sub-excavate unsuitable material and backfill with granular material in order to protect the roadway from settlement failure or the action of frost in the subgrade.

There are no 4(f) lands or historic sites in the project area.

An archaeological survey in the West Fork area has been conducted by Montana State University scientists. Their investigation yielded 7 archaeological sites which were open, seasonal campsites on glacial till or local colluvium and alluvium. None of the sites were characterized by lengthy cultural and/or depositional histories. No visible surface features such as burials, cairns, tipi rings or rock lines were found.

The Montana Department of Highways has a continuing agreement with the University of Montana which provides for investigation and preservation of any artifacts discovered during construction.

The project will provide a fast, safe, efficient and scenic highway facility for the public to travel. This type of facility is necessary for emergency vehicles, busses and commercial vehicles, as well as the general public. It will enable people to reach religious, educational, cultural and employment opportunities in addition to the recreational pursuits.

III. PROBABLE ADVERSE ENVIRONMENTAL EFFECTS WHICH CANNOT BE AVOIDED

A minimal amount of air and water pollution will occur during and for a short period of time after construction. Noise levels will be higher than at present, but due to the moderate traffic volumes and low percentage of trucks, it

will be a Low Noise Level Highway, as defined by Federal Highway Administration PPM 90-2.

Approximately 150 acres of land will be required for the project. No federal or state lands will be taken. Clearing and grubbing will be confined to the area actually required for construction.

The commitment of right-of-way for the road will remove this land from its present use and will preclude its being used for other purposes as long as the roadway exists.

IV. ALTERNATIVES

A. LOCATION CRITERIA

In determining the most suitable location for this project, the following items were considered:

1. Horizontal Curvature

The horizontal alignment in mountainous terrain such as encountered on this project needs to be one which follows, as nearly as possible, the contour of the existing terrain. For this reason, the design standards for the project allow for horizontal curves of $12^{\circ}30'$. Because of the limitations of the terrain, an exception to these standards will be made in one area and two curves of 15° will be used. The curvature of the roadway will be designed so that the impact on the environment is kept to a minimum.

2. Grades

Winter travel in this area will involve snow-packed and icy roads for much of the season. Steep grades increase the hazards associated with slick roads. The design standards provide for grades up to 7%. Grades will be held to a minimum compatible with the terrain.

3. Exposures

Roadways with a south exposure receive the maximum amount of sunshine, which results in a minimum amount of icy roads. The route will maintain primarily a south exposure.

4. Existing Roadway

The existing Forest Service road has introduced one roadway scar in the area. Where possible, the new roadway will follow the old road to keep cut and fill scars to a minimum.

5. Landslides

As pointed out earlier in the discussion of the geology of the area, there are existing landslides and potential landslide conditions along the route. These areas vary in size and degree of activity.

Department of Highways' geologists and engineers have made studies of areas where slides have occurred or are likely to occur. The alignment will avoid these areas where possible or special design features

will be incorporated into the plans to preclude their becoming a problem.

B. DESCRIPTION OF ALTERNATES

For most of the route it was possible to establish a location which met the criteria. The location follows the existing roadway except where alignment and grade dictated otherwise. The exposure is good throughout.

A study of alternate alignments was required between Station 170 \pm and Station 320 \pm because of a landslide area at approximately Station 280. This slide is quite extensive, 300' wide and 400' long. Conditions are such that the cost of correction, if indeed feasible, would be enormous. Five alternate lines have been studied in this area. Exhibit B illustrates the alternate lines.

1. Alternate "A"

Alternate "A" would stay on the south side of the Middle Fork for a distance of about 1 mile, then would cross the Middle Fork and climb an unnamed draw to near an old sawmill. It would continue to climb to a ridge above the slide area and then contour around to a point where it would rejoin the existing roadway.

Alternate "A" has reasonably good horizontal alignment with the maximum degree of curvature being 12 $^{\circ}$. The maximum grade would be 7% and this

grade would be continuous for 1.4 miles. A fill height of 85 feet would be required at the crossing of the Middle Fork.

This alternate would have poor exposure in the first mile and reasonably good exposure for the remainder of its length. It crosses an old slide area in the first mile and special design features would be required to prevent activating the slide as a result of construction.

2. Alternate "B"

Alternate "B" would cross the Middle Fork in the same location as the existing roadway, climb and cross the North Fork below the existing road, climb the slope on the north side of the Middle Fork, cross the unnamed draw and join Alternate "A" on the west side of the unnamed draw.

Alternate "B" would have curvature similar to Alternate "A". The maximum grade would be 7% and this grade would be 1.2 miles in length with an additional 0.5 miles at 6%. A 75-foot high fill would be required at the crossing of the unnamed draw.

No major geological problems are anticipated and the alternate would have good exposure throughout.

3. Alternate "C"

Alternate "C" would depart from Alternate "B" near the crossing of the Middle Fork. It would follow the North Fork to a crossing above the existing road. It would then follow higher on the slope above the Middle Fork and join Alternates "A" and "B" near the old sawmill.

Alternate "C" would have horizontal alignment similar to Alternates "A" and "B" with the maximum degree of curvature being 12° . The maximum grade would be 7% and this would run continuously for 1.7 miles. A fill height of 60 feet would be required at the crossing of the North Fork. This fill would be in an area which Big Sky plans to develop into an equestrian area with bridle paths, a rodeo grounds and an amphitheater. The roadway in this location could lessen the area's attractiveness for these uses.

This alternate would have good exposure throughout and no major geological problems are anticipated.

4. Alternate "D"

Alternate "D" would be on the same location as Alternate "B" until it crosses the unnamed draw where Alternate "D" would continue northwesterly, passing below the slide area and tie into the other alternates at the end of the study.

Alternate "D" would have good horizontal alignment with a maximum degree of curvature of 10° . The maximum grade would be 9%. This alternate would have 0.5 miles of 9%, 0.3 miles of 7% and 1.1 miles of 6% grade.

A fill height of 90 feet would be required at the crossing of the unnamed draw.

This alternate would have poor exposure in the last mile. No major geological problems are anticipated.

5. Alternate "E"

Alternate "E" is a modification of Alternate "D". It would involve a switchback into the unnamed draw rather than a straight crossing.

Alternate "E" would have a maximum degree of curvature in the switchback of 15° . This would reduce the fill height in the unnamed draw to 70 feet. The maximum grade would be 9% with 0.8 miles of 9%, 0.4 miles of 7% and 0.8 miles of 6%.

This alternate would have poor exposure in the last mile. No major geological problems are anticipated.

C. THE DO-NOTHING ALTERNATE

The "do-nothing" alternate may have appeal to the group of people who would prefer that Big Sky not be built. This would present a hardship for the developer,

might limit economic opportunities in the area and could greatly inconvenience future residents of the area. Furthermore, it might not represent the most desirable alternate from an environmental standpoint.

It is relatively certain that Big Sky will proceed with their development and a roadway is required to transport people to the upper area. Should they be forced to use the existing roadway, or some less expensive modification of the existing roadway, the result would be heavy volume of traffic on a low-class roadway with poor drainage, very little surfacing, steep slopes and little or no ditch. The resultant dust, mud and erosion could be substantial and very detrimental. From a safety standpoint, this would be less than desirable.

The proposed highway will provide access to recreational facilities that are open to the general public. It will also provide access to privately owned property and public domain lands.

D. THE SELECTED ALTERNATE

The selected alternate is a combination of Alternate "B" and Alternate "C". From the beginning of the section under study it will follow Alternate "B", cross the Middle Fork approximately where the existing road crosses, climb and cross the North Fork below the existing road, climb the slope on the north side of the Middle Fork,

then depart from Alternate "B", climb on the east side of the unnamed draw, tie into Alternate "C" just below the old sawmill and follow Alternate "C" to the end of the study.

The connection between Alternate "B" and Alternate "C" is shown on Exhibit B as a dashed line. Minor adjustments of the alignments and grades of Alternates "B" and "C" will be required to accommodate the connection. However, these changes will not materially affect the location or impact of the alignment.

The selected alternate will have a maximum degree of curvature of 12° . The maximum grade will be 7% and this grade will be continuous for 1.6 miles. The maximum fill height will be less than 50 feet at the crossing of the North Fork. Along a portion of the connection a full-bench cut in competent shale and sandstone will be required. No major geological problems are anticipated. This alternate will have good exposure throughout and will make maximum use of areas previously scarred by roadway construction.

V. THE RELATIONSHIP BETWEEN LOCAL SHORT-TERM USES OF MAN'S ENVIRONMENT AND THE MAINTENANCE AND ENHANCEMENT OF LONG-TERM PRODUCTIVITY

Construction of the highway facility will require disruption of the land surface, removal of timber within the construction limits and a temporary increase in air and water pollution. However, when completed and when revegetation

has been established, the project will provide a road with stable slopes, proper drainage and a minimum of environmental degradation. The highway will provide a fast, safe and efficient transportation facility for the traveling public.

The area is undergoing a change in land use. This change will be aided by the provision of a modern highway. Whether the highway is constructed or not, there is no doubt that the land use change will continue.

VI. IRREVERSIBLE AND IRRETRIEVABLE COMMITMENTS OF RESOURCES

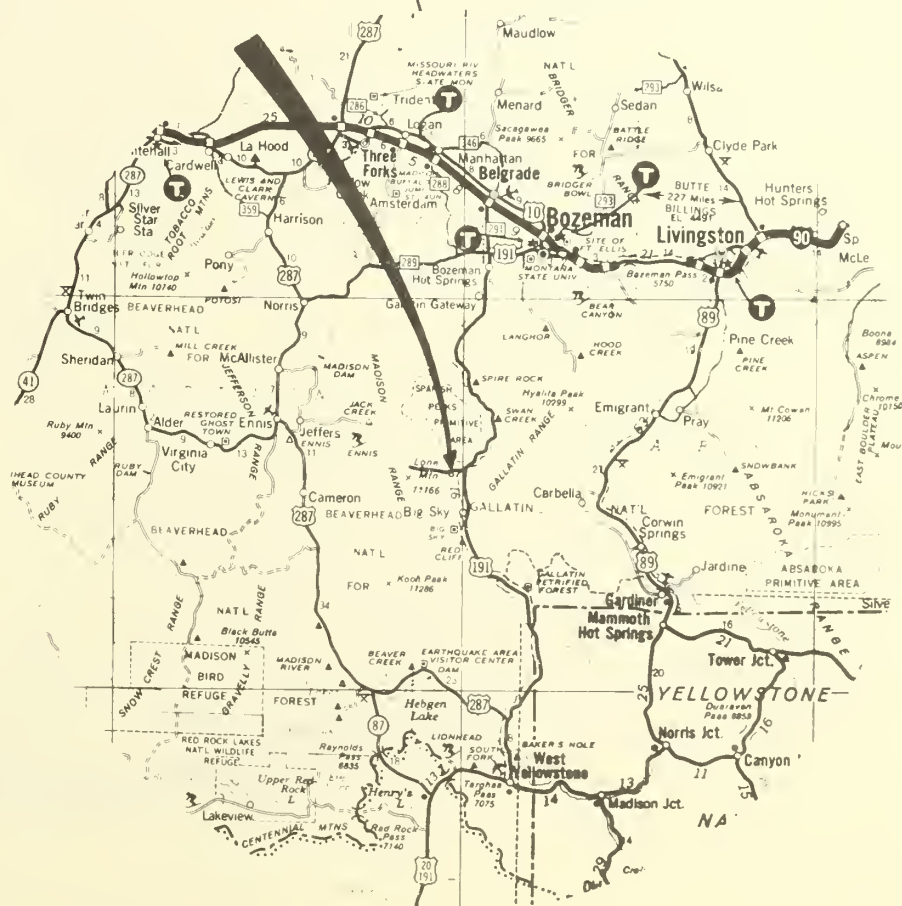
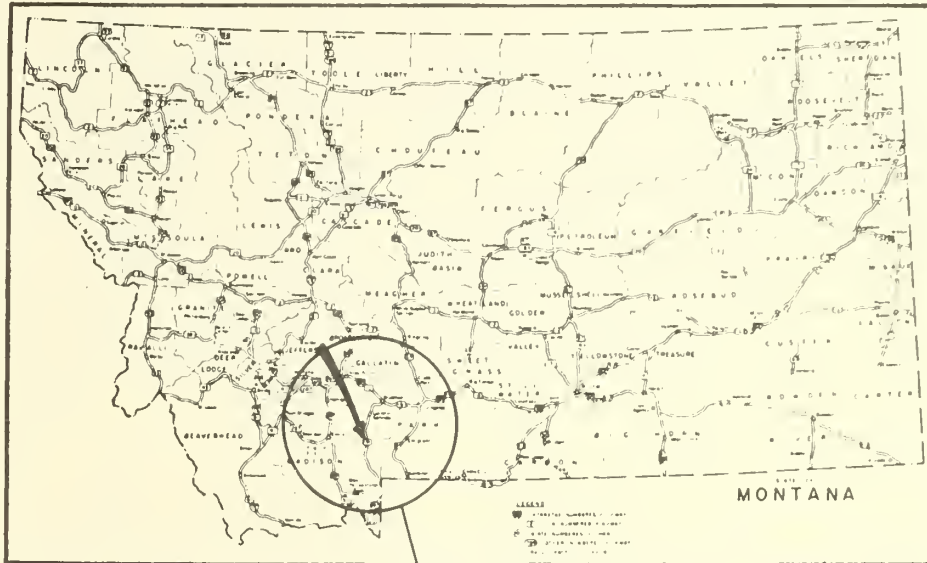
The land acquired for right-of-way will no longer be available for timber production or livestock grazing. This acreage, however, is not of sufficient quantity to be significant.

Also, the gravel used in the roadway surfacing will be irretrievable, but here again the quantities involved are not significant.

The greatest commitment of resources involved is the change in land use that will result. The highway improvement will act as a catalyst for this change. The change in land use from ranching and timber harvesting to primarily recreational use will be desirable for future generations.

VII. EXHIBITS

EXHIBIT A
LOCATION MAPS



0184
EXHIBIT "B"
MAP OF ALTERNATES
F-2014
US 1913418
SCALE 1:500







096 44

EXHIBIT "B"

MAP OF ALTERNATES

F-200

US 191 SPUR

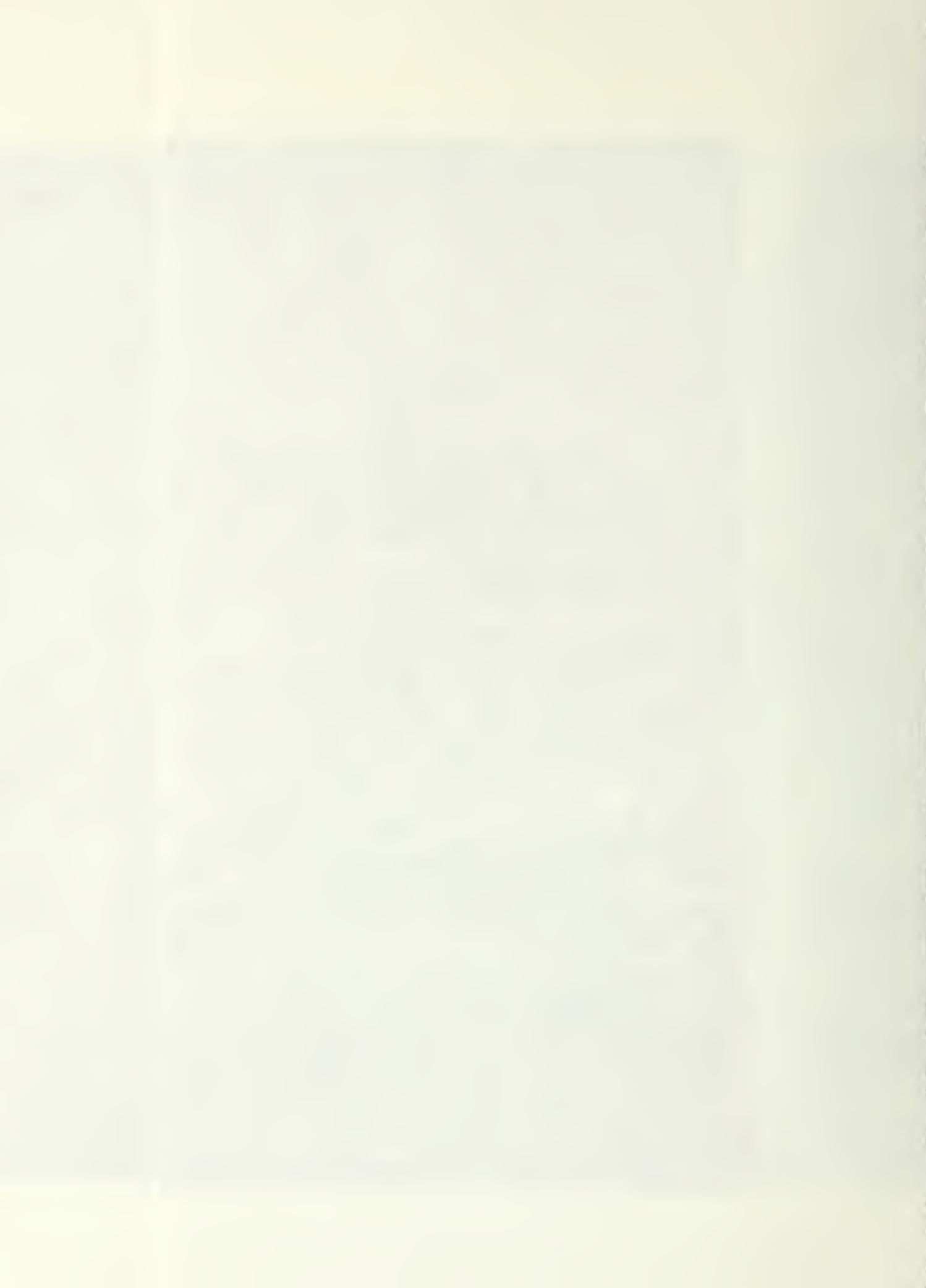
SCALE 1" = 500'

MIDDLE FORK

UPPER VILLAGE AREA

LEERS
LAKE

3570K
3500A

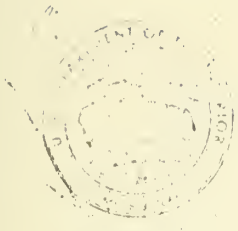


APPENDIX A

COMMENTS ON DRAFT STATEMENT AND RESPONSE

For ease of reference, the letters received as a result of the distribution of the Draft Environmental Statement are numbered in the order they appear in the distribution section. The page numbers referred to in the letters are page numbers from the draft statement and do not necessarily coincide with page numbers in the final statement. Where appropriate, a response follows each letter giving a discussion of the comments and suggestions. The responses follow the format of the corresponding letters as much as possible.

Ltr #1



United States Department of the Interior

OFFICE OF THE SECRETARY
WASHINGTON, D.C. 20240

MONTANA HIGHWAY COMMISSION

RECEIVED

JUN - 3 1972

HELENA, MONTANA

MAY 30 1972

F3039

ER 72-308

Dear Mr. Anderson:

This responds to your letter of February 28 requesting the Department of the Interior's comments on the draft environmental statement for the proposed construction of U.S. 191 Spur, about 9.7 miles along the West Fork of the West Gallatin River from U.S. 191 in Gallatin County, Montana.

The proposed project will not affect any existing or known potential units of the National Park System or any eligible or registered Natural, National Historic or Environmental Education Landmarks. However, the State Liaison Officer for the National Register should be consulted for matters pertinent to the Historic Preservation Act of 1966 (P. L. 89-665). He is the Chief of Recreation and Parks Division, Department of Fish and Game, State of Montana, Mitchell Building, Helena, Montana 59601. In addition, we recommend that the environmental statement indicate the action taken or proposed to determine whether archeological resources are present in the project area. Recommendations and proposed actions resulting from a professional archeological survey should be included in consideration of the project's effect upon cultural environmental values.

Hydrologic resources have been considered in the statement and the draft indicates that these resources will be considered in the solutions to engineering problems. However, the statement does not adequately discuss the severity of anticipated hydrologic problems, nor possible solutions to them. For example, ground water is reported to move along the shale-gravel contact, but the statement does not discuss whether highway cuts will intercept this ground water. Interception of ground water and its disposal could cause changes in the natural flow system and changes in the quality of surface water. Other possible problems include construction of the highway across areas of high water table. Data in the statement are not sufficient to determine whether construction in these areas will cause permanent changes in the elevation of the water table. The draft statement mentions drainage structures and that their

design will be based on hydrologic and hydraulic studies; however, the draft does not describe the magnitude of the hydrologic events used in the design (50-year flood, 25-year flood, etc.) nor how the magnitude of these events will be determined.

The draft statement indicates on page 24 that the proposed project may eventually be extended into the Madison Valley and connect with U.S. 287 near Ennis, Montana. If the proposed U.S. 191 Spur-route is constructed, the probability of constructing an extension into the Madison Valley would be greatly increased. This is a secondary impact of the currently proposed Spur route and deserves further consideration in the draft environmental statement. The final environmental statement should discuss present conditions on the lands which could be traversed by a possible highway extension into the Madison Valley.

Since the proposed project is within the boundaries of the Gallatin National Forest, the final statement should show the acreage of public land which would be taken for the highway project. Additionally, from the general information provided, it appears that preparation of a Section 4(f) determination may be necessary to reflect, in particular, the taking of National Forest land which has special value for its recreational uses and scenic resources. The determination should discuss measures to mitigate the impact of highway construction on the lands traversed.

The final position on the Section 4(f) determination, if one is prepared, will be made by the Secretary of the Interior when we are asked by the Department of Transportation to review the final combined statement.

Sincerely yours,


Deputy Assistant Secretary of the Interior

Mr. H.J. Anderson
Director of Highways
Montana Highway Commission
helena, Montana 59601

Paragraph 2: A statement about archaeological investigations has been added to the Probable Impact of the Proposed Project Section of the final statement.

Paragraph 3: No major impact on hydrologic resources is anticipated, although most highway construction has a localized impact on ground water flow and water table elevation. Highway cuts will, in some instances, intercept the ground water flow along the shale-gravel contact. Changes in the ground water elevation can be expected, both upward and downward as a result of cuts and fills, sub-excavation and drainage. Also, changes in water quality can be expected, mostly of a temporary nature. None of these changes are considered to be of such magnitude to require remedial action. Drainage structure design is based on 50-year flood frequency and this data is calculated using accepted engineering procedures.

Paragraph 4: The construction of the spur in no way commits the Montana Department of Highways to extending the route into the Madison Valley. The majority of the lands between the end of the spur and the Madison are publicly held and a complete environmental analysis would be required prior to initiating any action with regard to extending the route.

Paragraph 5: All land required for the right-of-way is privately owned. Therefore, no section 4(f) lands are involved and no 4(f) determination is required.

STATE OF MONTANA

Department of Highways

FLETCHER E. NEWBY
Executive Director

POSTAL STATION HELENA, MT. 59601

March 24, 1972

Department of Highways
Helena,
Montana

Attention: Mr. Grover Powers, Supervisor
Preconstruction Section

Gentlemen:

I urge you to add Dr. James Jezeski, Center for Environmental Studies, Montana State University to your mailing list for future impact statements, particularly those covering projects in the Big Sky-Gallatin Canyon area. Copies of the U.S. 191 Spur draft statement are presently circulating among the Gallatin Canyon study team members and I trust they will perform a more thorough review than we, being more intimately familiar with the immediate area and possessing a wider range of expertise.

The following are EQC staff comments which we would like to have incorporated into the final environmental impact statement on Project F-20(1) U.S. 191 Spur.

Page 13. According to the MSU Soils Interpretation Map mentioned in paragraph 2 the proposed roadway, regardless of alternative, will pass over soil associations with moderate to severe limitations for roads and parking based on excessive slope, susceptibility to frost heave, and shallow depth to bedrock.

Page 14. The last sentence of paragraph 1 is partly in error. The Ulerys Lakes, although only 6 to 7 acres in size, provide an excellent rainbow trout fishery according to the Fish and Game Department and local information. They are only a half mile or so above the Upper Village site which will be serviced by the roadway in question (Exhibit "B"). Access to these lakes was limited in the past and fishing pressure light. However with the new road public fishing pressure will likely be much greater.

Page 26. The probability of increased road kills due to increased traffic volume and vehicular speed should be considered as an impact on wildlife.

Thank you for the opportunity to comment on this impact statement.

Sincerely yours,

FLETCHER E. NEWBY
Executive Director

General: Dr. James Jezeski, Center for Environmental Studies, Montana State University, has been furnished copies of the draft statement. The study conducted by the Center for Environmental Studies is included in this report as Appendix C.

Page 13: Paragraph 2 has been modified to include this information. It would be desirable to include the Montana State University Soils Interpretation Map in this statement. However, because the map is large and in color, it is difficult to reproduce.

Page 14: The first paragraph has been modified to include the information about Ulerys Lakes.

The section on Fish and Wildlife has also been expanded to include discussion of Ulerys Lakes.

Page 26: Discussion of wildlife being killed on the new roadway has been added.

File	Recd.	Preconst.	3-31-72
30	PROP. MMH		
30	Field Des. in		
30	Structing Design		
30	On-site Engineers		
32	West Region		
32	Landscape		
33	East Region		
34	Hydraulic		
37	Planning		
37	Roads		
37	Consultant Design		
File			

Ltr #4

MONTANA HIGHWAY COMMISSION
RECEIVED
APR 11 1972
HELENA, MONTANA

ENVIRONMENTAL PROTECTION AGENCY

REGION VIII
SUITE 900, 1860 LINCOLN STREET
DENVER COLORADO 80203

April 6, 1972

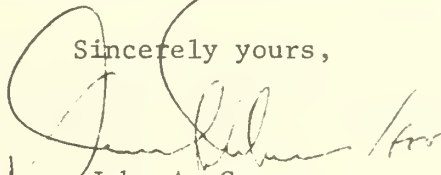
Mr. Grover O. Powers, P.E.
Supervisor - Preconstruction Section
Montana Highway Commission
Helena, Montana 59601

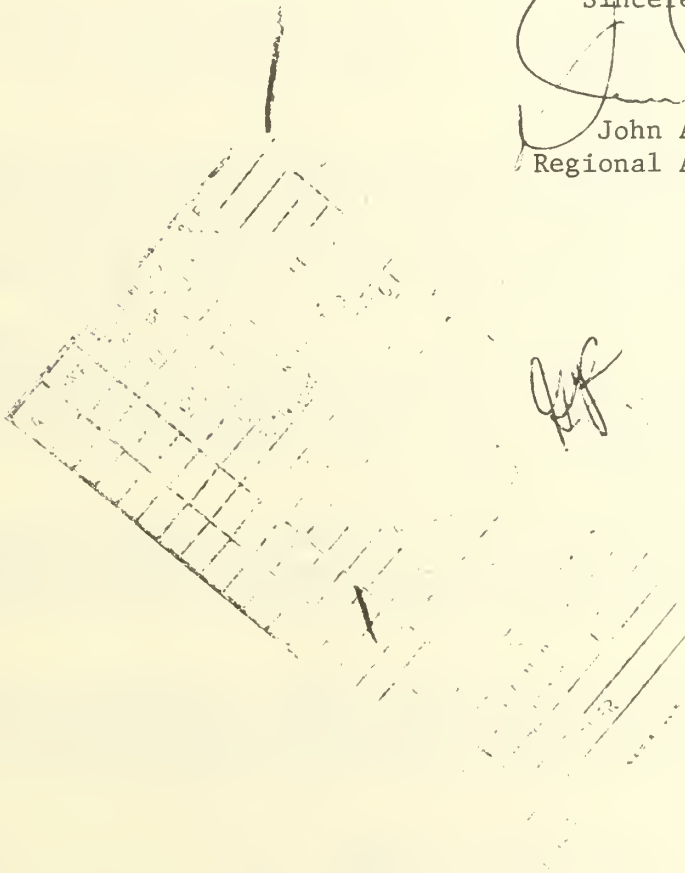
Dear Mr. Powers:

The Environmental Protection Agency has reviewed the draft environmental statement for Project F-20(1), U.S. 191 Spur. Generally, the statement adequately describes the project and measures planned for protection of environmental quality during construction.

Please send us a copy of the final environmental statement.

Sincerely yours,


John A. Green
Regional Administrator



Date Recd. Preconst. 4-11-72	
Act	Info
	MAIL ROUTE
	30 GOP RMH
	30 Field Design
	30 Surfacing Design
	31 Office Engineers
	32 West Region
	32 Landscape
	33 East Region
	34 Hydraulic
	36 Traffic
	37 Pub. Hearing
	38 Sec. Roads
	39 Consultant Design
	File

Ltr #5

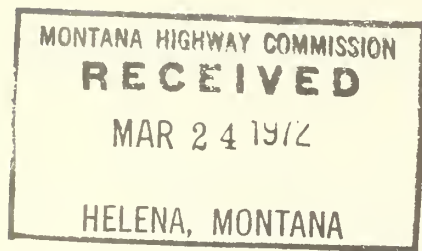
Inter-County Development Corporation of Southwestern Montana

H. H. GRANT
Director

Hotel Marcus Daly
Anaconda, Montana

Post Office Box 1179
Phone 563-2077

March 22, 1972



RETURN TO M & C MAY BE RETURNED DIRECTOR		32-GDP	
H-20 (1)		U.S. 191 Spur	
ENGINEERING		CROSS-SECTION	
MATERIALS		RIGHT-OF-WAY	
PP. CON. ETC.		MAINTENANCE	
INF		ACT	

Mr. H.J. Anderson
Director Of Highways
Montana Highway Commission
Helena, Montana 59601

Dear Mr. Anderson

It was most considerate of you to send the Draft Environmental Statement relative to the extension of a road at Big Sky, for this organization's review and comments.

The proposal to construct an additional 6.7 miles of road extending the present three mile spur to connect the Big Sky Lower Village with the Upper Village is certainly worthy of support and approval, while any adverse impact on the environment that might result would be so minimal as to be unworthy of more than cursory consideration.

Especially when the road is considered in it's proper perspective as a very vital element of the Big Sky Development. A development which is destined to considerably benefit not only Gallatin County and it's residents by the creation of new jobs, generation of tax dollars etc., but Madison County as well.

In fact Madison County, which, because of excessive unemployment and a low economy, has been designated as a "Redevelopment Area" by the Federal Government, will undoubtedly realize the greatest benefit to it's economy.

In view of the above it is only appropriate that the support of myself and this organization be added to that of the many persons just as strongly in support of the Big Sky Development and the proposed spur.

Very Truly Yours,

A handwritten signature in cursive script, appearing to read "Harry H. Grant".

Harry H. Grant
Executive Director

C.C. Walt Myers

General: We do not agree with the statement that "...any adverse impact on the environment that might result would be so minimal as to be unworthy of more than cursory consideration." Both the road project and the Big Sky Development will have an impact on the environment. The objective must be to recognize these impacts early in the development of a project and to assure that they are considered throughout the planning, design, construction and post-construction periods.

2

Ltr #6

MONTANA HIGHWAY COMMISSION
RECEIVED
MAR 28 1972
HELENA, MONTANA

MADISON COUNTY OEDP COMMITTEE

Virginia City, Mont.
March 27, 1972

Mr. H.J. Anderson
Director of Highways
Montana Highway Commission
Helena, Mont. 59601

~~32-605~~
20 (1)
HS 191 Spur

Dear Mr. Anderson:

The Madison County OEDP Committee, at their meeting Mar. 21 in Virginia City, expressed their appreciation for their copy of the Draft Environmental Statement.

After studying the report the Committee voted to support this 191 Spur 100 % and asked that a letter be written confirming that this 40 member committee was backing this project to its fullest extent.

Again thanking you and should it be possible for us to supply support or assistance in any other way, please let us know.

Sincerely,

Walter H. Myers
Walter H. Myers, Chairman
Madison County OEDP Committee
Virginia City, Mont.

RETURN TO MAIL ROOM	
MAY BE RETAINED	
DIRECTOR	
CENTRALIZED SERVICES	
ACCOUNTING	
DATA PROCESSING	
PLANNING & RESEARCH	
ENGINEERING	
PRECED. BUREAU	
BRIDGE	
CONSTRUCTION	
MATERIALS	
PRECED. SECTION	
RIGHT OF WAY	
GROSS VEHICLE WEIGHT	
LEGAL	
MAINTENANCE	
MOTOR POOL	
PERSONNEL	
OTHER	

Date Recd.	Preconst.	9-28-72
Act	Info	Initial
		Attach
	MAIL ROUTE	
	30 GCP, MH	
	30 Field Ins. Sp.	
	30 Sub. Ins. U. 580	
	31 Sub. Ins. U. 580	
	32 Vicar Region	
	32 Longscape	
	33 East Region	
	34 Hydraulic	
	36 Ins. Sp.	
	37 Field Ins. Sp.	
	38 Sub. Ins. U. 580	
	39 Sub. Ins. U. 580	
	40 Sub. Ins. U. 580	
	41 Sub. Ins. U. 580	
	42 Sub. Ins. U. 580	
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	96 Sub. Ins. U. 580	
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	98 Sub. Ins. U. 580	
	99 Sub. Ins. U. 580	
	100 Sub. Ins. U. 580	

Big Sky of
Montana, Inc.
P. O. Box 80
Gallatin Gateway
Montana 59730
(406) 763-4249

2 Ea

7m & F Ltr #7
JOF
F 20 ①

General Counsel

March 21, 1972

Montana Highway Commission
Helena, Montana 59601

Attention: Mr. Grover O. Powers, P.E.,
Supervisor-Preconstruction
Section

Re: Response and comment to
Draft Environmental
Statement

Gentlemen:

In accordance with your letter of February 28, 1972, please find below our comments and response to the Draft Environmental Statement for project F-20 (1) U.S. 191 Spur, to be constructed from the Big Sky of Montana, Inc. Meadow Village to the Big Sky Mountain Village.

To follow the continuity of the Draft the comments by Big Sky will follow the sequence of the information as presented in the Statement itself.

- (1) A statement is contained on pages 1 and 24 that the Big Sky of Montana, Inc. complex will cost "\$20,000,000". We are unable at this time to state exactly how much money is going to be invested and spent in the development of the Big Sky resort complex. For this reason it is perhaps misleading to use a specific dollar figure and we suggest that the dollar amount utilized be eliminated and that instead a more accurate reference be made to the fact that it will be a year-round resort complex. The figure of \$20,000,000 may be exceeded or may not be reached depending upon many factors over which Big Sky has no control. In the interests of accuracy, therefore, we suggest that there not be a statement of a specific sum of money.
- (2) On page 11 of the Statement the estimated date for the awarding of contracts is in 1973. Based upon information previously submitted to us there is the possibility that contracts may be awarded in late 1972. We only point out this possibility for the purposes of total disclosure in the Draft Statement and if such a possibility does exist perhaps the sentence could be re-phrased to read that the contracts may be awarded in late 1972 or in 1973.
- (3) In paragraph I-B covering pages 10, 11 and 12, a brief statement on the Big Sky project is set forth. A significant phase of our operations has been omitted in that no mention was made of our Lone Mountain Guest Ranch on the North Fork of the West Fork. This Guest



Ranch has been in operation since the 1930's and was substantially remodeled by Big Sky in 1971. It is presently fully operational and an integral part of Big Sky's facilities which would be serviced by the proposed 191 Spur.

- (4) On page 13 there is a sentence which reads "Big Sky Inc. is a land development corporation." The correct company name, of course, is Big Sky of Montana, Inc. - we also would like to point out that we are basically not a land development company, but are rather a resort developer and operator. Certainly, Big Sky is in the land development business, as we will be marketing homesites and condominiums, but we feel that undue emphasis is placed in the Impact Statement upon the land development phase of our operations. The sale of lots and condominiums is an adjunct to the main objective of the Big Sky project i.e., the creation and operation of a major resort complex. We would also like to request that a statement be included that all facilities at Big Sky will be open to the public and the use of the proposed road would primarily be by the general public as opposed to the relatively minor use of the road by people who purchased property at Big Sky.
- (5) On pages 16 and 17 a great deal of emphasis is given to the ice or rock glaciers on the east flank of Lone Mountain. We believe that an erroneous impression is given that the ice or rock glaciers are found on the proposed site of the road. The information we have received from our independent engineers - Northern Testing Laboratories, Inc., is that the ice glaciers referred to in the National Science Foundation study are, in fact, not located on or near the road site and would not be disturbed by road construction. There is a very strong statement found at the bottom of page 16 and the top of page 17 as to the effects on the rock or ice glaciers by man made facilities and the instability of these geologic features. We believe that if this statement from the Montana State University study is to be included, a qualification should be also inserted stating that the road will not affect these rock or ice glaciers as they are not found on or even near the site of the proposed road. Similarly, we believe there is a very clear implication that the construction to be undertaken by Big Sky of its Mountain Village complex which will be serviced by the proposed road, will be built over an area which includes these rock or ice glaciers. Our studies have shown that the rock or ice glaciers are located at a site other than that of the Mountain Village and we do not

want it inferred from the Draft Statement that our Mountain Village will interfere or disturb these features, as we are constructing our facilities including lifts to specifically avoid disturbance or harm to these features. Additionally, we do not wish to give the impression that we are engaging in construction in an unstable area, as we certainly have no such intention.

- (6) On page 17 reference is made to earthquakes which occurred in Lake Hebgen "a few miles south and west of West Fork". In fact, the quake area is more than 30 miles directly south of Big Sky on the Madison side of the Gallatin range. We would prefer, therefore, that if reference is to be made to the quake zone, that it be more specifically referred to by giving the actual distances and location

Generally, however, we believe that the Draft Environmental Statement was well done and fairly sets forth the true Environmental Impact of the road. In the explanation of the fact that the West Fork will be developed, perhaps mention could be made that the majority of the land in the West Fork is privately owned and the holdings of other persons or entities exceed those of Big Sky; we mentioned this as we believe the report gives the impression that the proposed road will only give access and service to the Big Sky project which is not the case.

Reference is made in the report to soil erosion caused by the construction of the road, we wish to point out that any such erosion will be mitigated by soil erosion control procedures initiated by Big Sky. By the time any work is commenced on the proposed road, at least two dams will have been completed by Big Sky on the Middle Fork below the site of such construction. These have been constructed for esthetic as well as siltation control purposes and will serve to significantly reduce any adverse affect to the stream by the road construction.

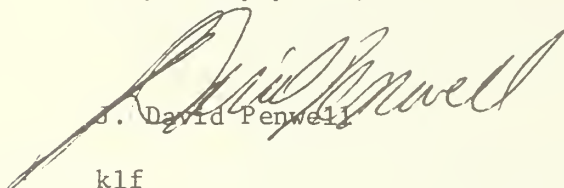
An attempt has been made, and properly so, to explain what the impact of the road will have on the wildlife in the area (which is minimal) and also to explain what the impact of the Big Sky project will be on the wildlife since the two projects are necessarily related. All livestock except for horses used on the Dude Ranch have been removed from the Middle Fork. The master plan for Big Sky calls for approximately 25% of the total land holdings by Big Sky (including the golf course construction) to be actually developed. The remainder of the property will be either left in its natural state, reclaimed, or be subjected to land management techniques which do not include development for human habitation. As has been stated by the Montana Fish and Game Commission, these factors will result in a significant improvement of the area as a wildlife habitat. In this setting, use of the existing logging road would not be as favorable environmentally as a road built to primary standard quality. Construction of the primary road would have minimal impact as the proposed road would, for the most part, follow the route of the existing logging road and cause less damage

Mr. Powers
March 21, 1972
Page 4

while being built, in comparison to construction over an area where no road existed previously. The logging road is unsurfaced and has improper drainage causing it to wash out every spring, a situation which would be eliminated by the proposed primary, removing a major cause of erosion and sedimentation to the Middle Fork.

We wish to thank you for allowing us to respond to the Environmental Statement. If you should have any questions or desire any additional information, please do not hesitate to contact us.

Very truly yours,


J. David Penwell
klf

Date Recd. Preconst. <u>3-27-72</u>				
Act	Info	MAIL ROUTE	Attach	Initial
		30 Cont. Admin		
		30 Field Design		
		30 Scheduling Design		
		31-6111-1000000000		
		32 West Region		
		32 Landscape		
		33 East Region		
		34 Hydraulic		
		35		
		37		
		38		
		39 Cont. Design		
		File		

(1) The reference to a specific dollar figure to be invested in the development of the Big Sky resort complex has been deleted.

(2) The latest available information indicates the project will not be awarded prior to 1973, so the wording on page 11 has been retained.

(3) Mention of the guest ranch has been included.

(4) The first paragraph of the land use section has been rewritten.

(5) Since the statement taken from the Montana State University study is a quote, it will not be changed. It should be noted, however, that the proposed roadway will not cross any rock or ice glaciers and there is no intention to indicate that Big Sky facilities would be built over these features.

(6) Here again, the information concerning the 1959 earthquake is a part of the quote from the Montana State University study and the quote will not be changed. It is true that the Hebgen Lake quake area is about 30 miles from the project, but it is also important to recognize that Southwestern Montana has experienced damaging earthquakes in the past and earthquake potential should be considered as a part of the existing project environment.

HELENA, MONTANA

UNITED STATES DEPARTMENT OF AGRICULTURE
FOREST SERVICE

Region One, Missoula, Montana 59801

REPLY TO: ~~1940 Environmental~~ Statements

SUBJECT: Project F20(1) U.S. 191 Spur

TO: Mr. H. J. Anderson, Director of Highways
Department of Highways
Sixth Avenue & Roberts
Helena, Montana 59601

As per Fred Burnell's telephone conversation with Kenneth Skoog, we have withheld our comments on the U.S. 191 Spur statement until after the hearing. We have reviewed the statement and our comments follow.

We favor exploring a compromise route that is a combination of routes B and C. This compromise route which more nearly follows the existing road would reduce fill heights, require less clearing, and have the least visual impact. Changes in the alignment at Beehive Creek should be considered to lessen the land impacts.

In developing this route, we have to have adequate ties to North Fork Trail #16, Beehive Basin Trail #40, West Fork Loop Road #266B, and Andesite Road #2657. These ties may require additional rights-of-way in the name of the U.S. Government.

Wildlife crossings under the highway should be considered where appropriate and possible.

With reference to the overall philosophy of the report, we disagree with the conclusions or assumptions on page 33 that ". . . the change in land use from ranching and timber harvest to primarily recreation use," would be beneficial. Over a long period this assumption about benefits may or may not be true. Also, both the Burlington Northern and the Forest Service advocate multiple use and probably will continue to produce livestock and other products on their lands.

As the final location and design of this project progress, we will need to review the work on the ground to determine such things as the need for unloading facilities at trail heads, their location parking area responsibilities, etc.

Саша

C. A. MILLER, Chief
Division of Engineering

Paragraph 2: The proposed route is basically as suggested by the U.S. Forest Service. It is a combination of Alternates B and C. The alteration which is suggested at Beehive Creek would entail very restrictive horizontal curvature and is therefore undesirable from a safety standpoint.

Paragraph 3: The Forest Service, in their land trade with the Burlington Northern, retained the right-of-way for four existing trails. These trails will be considered in the design of the project and access to Forest Service roads and trails will be perpetuated.

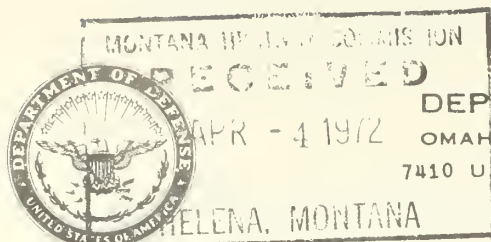
Paragraph 4: Since no heavy migratory game paths are crossed, it is not considered feasible to construct underpasses for wildlife crossings.

Paragraph 5: It is our belief that the change in land use will be beneficial. It would appear that the Forest Service should also have come to that conclusion prior to executing their land trade with Burlington Northern.

Paragraph 6: Final design details will be coordinated with the Forest Service.

222

Ltr #9



MROED-PE

DEPARTMENT OF THE ARMY

OMAHA DISTRICT, CORPS OF ENGINEERS

7410 U.S. POST OFFICE AND COURT HOUSE

OMAHA, NEBRASKA 68102

RETURN TO M & F	MAY BE RETURNED	DIRECTOR	CENTRALIZED SERVICES	ACCOUNTING	DATA PROCESSING	PLANNING & RESEARCH	ENGINEERING	PRECED. BUREAU	BRIDGE	CONSTRUCTION	MATERIALS	PRECED. SECTION	RIGHT-OF-WAY	CROSS VEHICLE WEIGHT	LEGAL	MAINTENANCE	MOTOR POOL	PERSONNEL	OTHER
IN	7																		
ACT																			

Mr. H. J. Anderson
 Director of Highways
 Montana Highway Commission
 Helena, Montana 59601

Dear Mr. Anderson:

I refer to your letter of 28 February 1972 transmitting the Draft Environmental Statement for Project F-20(1) U. S. 191 Spur. The following comments are offered concerning the subject draft statement:

Section I, C. Description of Existing Project Environment - This section should be expanded to include a discussion of the flora of the area.

Section II, B. Impacts on the Narrow Band Adjacent To The Project - This section should include data on the number of acres of trees to be cleared, the bridging of streams, and treatment of borrow areas. Also a discussion of the methods to be used to dispose of the cleared and grubbed material would be helpful.

Section III. Probable Adverse Environmental Effects Which Cannot Be Avoided. - The removal of trees for roadway construction should be mentioned in this section since it is an unavoidable adverse impact.

Section IV. Alternatives - It is noted that this section contains a discussion of the "do-nothing" option. The inclusion of this discussion is commendable.

Section VI. Irreversible and Irretrievable Commitments of Resources - The commitment of labor should be included here. The cost of labor of construction, any construction, is irretrievable.

MROED-PE
Mr. H. J. Anderson

29 March 1972

We appreciate the opportunity to review the subject draft statement.
The proposed action would not affect any existing or potential
Omaha District project.

Sincerely yours,

R. G. Burnett
for R. G. BURNETT, P.E.
Chief, Engineering Division

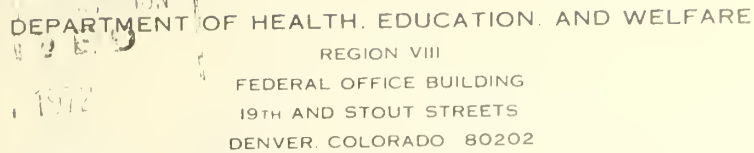
Date Recd. Preconst. <u>4-5-72</u>				
Act	Info	MAIL ROUTE	Attach	Initial
		30 GOP RMH		
		30 Field Design		
		30 Surfacing Design		
		31 Office Engineers		
		32 West Region		
		32 Landscape		
		33 East Region		
		34 Hydraulic		
		36 Frame		
		37 Pub. Hearing		
		38 Sec. Roads		
		39 Consultant Design		
		File		

Section I,C: An additional paragraph, 9. Vegetation, has been added to include discussion of the flora of the area.

Section II,B: Additional information on clearing, stream crossings and borrow areas has been included.

Section III: The removal of trees has been added as an unavoidable adverse impact.

Section VI: We do not necessarily agree that the cost of labor of construction is an irretrievable commitment of resources. The labor itself may be irretrievable, but the cost of labor may be recovered in benefits derived from the project.



April 14, 1972

OFFICE OF THE REGIONAL DIRECTOR

Re: Draft Environmental Impact Statement
Project F-20(1)
U. S. 191 Spur

Mr. H. J. Anderson
Director of Highways
Attn: Mr. Grover O. Powers, P.E.
Montana Highway Commission
Helena, Montana 59601

Dear Mr. Anderson:

We have reviewed the Draft Environmental Impact Statement for the referenced project as submitted to Region VIII, DHEW. This highway is located in a very sparsely populated area and will consequently have very little effect on the health and welfare of local citizens.

As a general comment we suggest, as the alternative to the highway, a helicopter lift for resort users should be considered.

Sincerely yours,

Thomas E. Moore
Regional Engineer
ROFEC

By:

Elwyn Holtrop, P.E.
General Engineer
Environmental and Inspection

Act	Info	MAIL ROUTE	Attach	Initial
		30 GOP RMH		
		30 Field Design		
		30 Surfacing Design		
		31 Office Engineers		
		32 West Region		
		32 Landscape		
		33 East Region		
		34 Hydraulic		
		6 Traffic		
		27 Pub. Hearing		
		31 Bus. Roads		
		35 Consultant Design		
		File		

RETURN TO M. & F.
MAY BE RETAINED
DIRECTOR

1

JF

General: The use of helicopters, gondolas, air cushion vehicles or other exotic modes of transportation are not covered in more detail because of the expense involved, the lack of ability to finance such systems, their inability to carry heavy loads of materials and supplies and the fact that these systems would also have adverse impacts on the environment of the area.

240 Ltr #.11



STATE OF MONTANA

INF	RETURN TO M & F	
	MAY BE RETAINED	
	DIRECTOR	
	CENTRAL SERVICES	
	ACCOUNTING	
	DATA PROCESSING	
	PLANNING & RESEARCH	
	GENERAL INVESTIGATIVE DIVISION	
	CRIMINAL DIVISION	
	LABORATORY	
	TRAINING DIVISION	
	OFFICE OF THE ATTORNEY GENERAL	
	OFFICE OF THE SECRETARY OF STATE	
	OFFICE OF THE COMPTROLLER	
	OFFICE OF THE STATE ENGINEER	
	OFFICE OF THE STATE GEOLOGIST	
	OFFICE OF THE STATE HISTORIC PRESERVATION	
	OFFICE OF THE STATE LAND COMMISSION	
	OFFICE OF THE STATE PARKS	
	OFFICE OF THE STATE TRAVEL	
	OTHER	

DEPARTMENT OF

FISH AND GAME

Helena, Montana 59601
April 12, 1972

Mr. H. J. Anderson
Director of Highways
Department of Highways
Helena, Montana 59601

Attention: Mr. Grover O. Powers

Dear Mr. Anderson:

As requested in your letter of February 28, we have reviewed the draft of the Environmental Impact Statement for Project F 20(1), U.S. 191 Spur. Following that review we would like to call some specific items to your attention:

On page 13, paragraph 2, land use is discussed. It would be more realistic to recognize that by adding recreational pursuits such as skiing, golf, tennis, swimming, and others made available through Big Sky, it is likely we will lose some of the present so-called "limited" fishing, hunting, hiking, camping, snowmobiling, and horseback riding. At the present time Big Sky is restricting much hunting, fishing, trespassing and snowmobiling on lands they control because it interferes with their use.

The loss of public land through the exchange with Burlington Northern is expected to further complicate these matters. The road in question accommodates this process which will eventually convert public lands to private use at a net loss to the average Montanan.

On page 20, economic activity is discussed, and it is suggested that ranching and logging can be expected to change little in the canyon. It is perhaps more realistic to recognize that both ranching and logging will decrease in importance in the future, since the area's recreational values will increase with or without Big Sky.

Also, in view of the fact many acres that have been logged are not near the relogging state, a decline in logging activity can be expected, at least in the immediate future.

On page 22, the fish and wildlife resource is discussed. In this section it should be recognized that the native cutthroat trout characteristic of much of

April 12, 1972

the West Fork's upper drainages could be in jeopardy with the increased access and subdivision accommodated by the road in question.

Once again in this section we see the reuse of our statement regarding the fact that the development of the Big Sky resort will have a minimum impact on the wildlife resource. In view of the satellite developments that continue to spin off from Big Sky as well as the statements made by persons associated with Big Sky, it is apparent that the impact of development goes far beyond Big Sky's original plan and could very well have an impact on wildlife living adjacent to Big Sky lands and wildlife presently secure in the Jack Creek drainage.

This is not to say that Big Sky itself has changed; however, the picture of satellite developments is now much clearer, and the net effect on the environment must be viewed in that context.

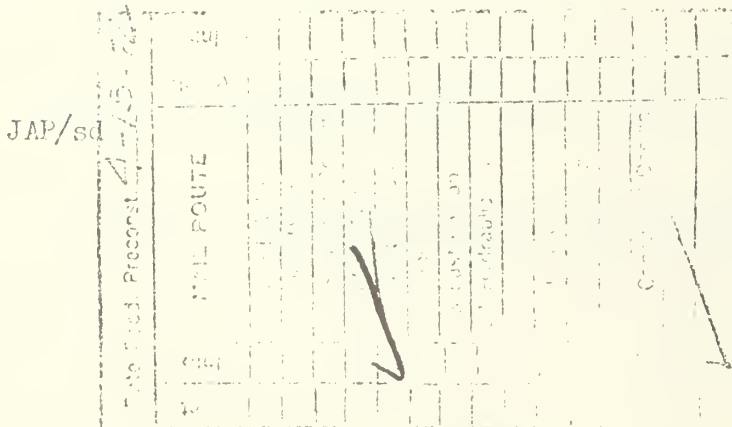
On page 23 the report discusses highway facilities, and specifically in paragraph 3 an average daily traffic rate is discussed. It would be more meaningful to discuss peak loads such as weekends, the 4th of July, Labor Day, Christmas, and similar seasonal periods. In this situation averages are much less significant than peak load discussions.

On page 28 exposure is discussed, and from the standpoint of our resource we would prefer the road located on a north-facing slope since less conflict would exist with wildlife attempting to use the critical south-facing slopes during fall and spring periods. We have also observed that the present road located on the slope in question has serious problems with land slippage.

In closing we thank you for the opportunity to comment, and hope our comments will be of use to you.

Sincerely,

DON L. BROWN
STATE FISH AND GAME DIRECTOR



Page 13, Paragraph 2: This section has been changed and expanded to more fully describe the land use changes. We do not agree that the average Montanan will suffer a net loss as a result of the land use changes.

Page 20: The section on economics activity has been revised.

Page 22: The section on fish and wildlife has been modified and expanded to more fully reflect the impact of increased population and accessibility.

Page 23: Traffic peaks are considered in roadway design. This is accomplished by determining the design hour volume (DHV) which is defined as the 30th highest hourly volume in the design year. For a highway such as U.S. 191, the DHV is normally about 14% of the design year ADT.

Page 28: It appears that the most desirable exposure for the roadway is in conflict with what is the most desirable for the wildlife resources. Because of the grades, curvature, and amount of snowfall, the southern exposure is very desirable from a safety and maintenance standpoint.

✓ Ltr #12

STATE OF MONTANA

OFFICERS:

JAMES A. STEFFECK, CHAIRMAN
HELENA
RICHARD O'BRIEN, VICE-CHAIRMAN
CONRAD
MICHAEL D. FERGUSON, SECRETARY
BILLINGS



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ROBERT G. BRICKER
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TOM BURRIS
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CHINOOK
DAVID L. MATOVICH
COLUMBUS

DIRECTOR:
WILLIAM E. HUNT

RECEIVED
MONTANA HIGHWAY COMMISSION

AERONAUTICS COMMISSION

P O BOX 1698

HELENA, MONTANA 59601

TELEPHONE 406 449-2506

March 7, 1972

Montana Highway Commission
6th Avenue and Roberts
Helena, Montana 59601

Gentlemen:

Re: 32-GOP, F-20(1), US191 Spur

The Montana Aeronautics Commission has reviewed the draft environmental statement for the subject highway project. The environmental impact of the proposed project from an aeronautical and airport aspect is totally nil. The recreational complex being constructed by Big Sky of Montana, Inc. will have an economic impact on the Gallatin Field Airport and Yellowstone Airport, the two air carrier airports closest to the proposed development.

Sincerely yours,

William E. Hunt, Director

Worthie M. Rauscher
Worthie M. Rauscher
Deputy Director

Date Recd. Preconst. 3-7-72				
Act	Info	MAIL ROUTE	Agent	Initial
		30 GOP, BAH		
		30 Field Station		
		30 Substation		
		31 Other Engineers		
		32 Main Region		
		32 Subregion		
		33 East Region		
		34 Subregion		
		35 Other		
		36 Other		
		37 Other		
		38 Other		
		39 Other		
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Act	Info	MAIL ROUTE	Agent	Initial
		30 GOP, BAH		
		30 Field Station		
		30 Substation		
		31 Other Engineers		
		32 Main Region		
		32 Subregion		
		33 East Region		
		34 Subregion		
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		50 Other		

Environmental Sciences Division

2tr #14

Board of County Commissioners

Madison County

Phone 843-5444

Highway Commission

Helena City, Montana

59755

CHARLES RAYMOND, Chairman
Sheepdan, Montana

HELLEN, MONTANA

NEIL L. MORGAN, Ennis, Montana

DOUGLAS ALLEN, Silver Star, Montana

3-7-77

April 15, 1972

State Department of Highways
Helena, Montana

Dear sirs:

I would like to comment on the proposed U.S. Highway 191 Spur, as to the testimony given during the hearing.

Too much time was spent there on opposition to the entire Big Sky Corporation project, very little to discuss the actual subject of the hearing. Since it deteriorated into a public debate and forum for various political discussions, I decided to withhold any statement, and offer this comment by letter, as it was my understanding that this is also admissible as part of the hearing.

Some opposition, namely that opposing use of public funds for the purpose of opening a highway route to a private enterprise, has some foundation, but we must weigh the good against the bad and decide accordingly. With this in mind, I would like to go on record as favoring the construction of the Highway 191 Spur, using whatever alternate State Highway engineers deem most suitable. This road will benefit the entire state, and will specifically benefit Madison and Gallatin counties.

Sincerely,

Douglas Allen

Douglas Allen

Madison County Commissioner

Ltr #15

STATE OF
MONTANA

DEPARTMENT OF PLANNING AND ECONOMIC DEVELOPMENT

MONTANA HIGHWAY COMMISSION

RECEIVED

APR 25 1972

HELENA, MONTANA

MAIL:
CAPITOL STATION
HELENA 59601

OFFICES:
1716 NINTH AVENUE
406 449-2400


April 21, 1972

Mr. H. J. Anderson
Director of Highways
Montana Highway Commission
Capitol Station
Helena, Montana 59601

Dear Mr. Anderson:

In response to the draft Environmental Statement for Project F-20 (1), U. S. 191 Spur, enclosed is a statement on behalf of the State Department of Planning and Economic Development. I would like to request that the statement be attached to the transcript of the Corridor Public Hearing held at Karst Camp on April 12, 1972.

Sincerely,


Perry F. Roys
Executive Director

COMMISSIONERS

ARREST H. ANDERSON
GOVERNOR

PERRY F. ROYS
CHAIRMAN AND
EXECUTIVE DIRECTOR

ROSS W. CANNON
HELENA

HANK CRISAFULLI
GLENDALE

DALE C. HAWKINS
BILLINGS

L. BILL HOLTER
GREAT FALLS

JOHN RUFFATTO
MISSOULA

PFR/RDT/pt
Enc.

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CAPITOL STATION
HELENA 59601

ADDRESSES:
606 NINTH AVENUE
HELENA 59601

April 21, 1972

MEMORANDUM

TO: Montana Highway Commission

FROM: Department of Planning & Economic Development

SUBJECT: Comment on Project F-20 (1) U. S. 191 Spur Draft
Environmental Statement

The Montana State Department of Planning and Economic Development has been given the state responsibility in section 82-3705 of the Revised Codes of Montana, 1947, for "recreational planning and development which is directly related to private investment in recreation facilities". As a result, this department has worked closely with the larger recreational developments in the state in the last several years to insure recreational facilities of high quality and sound planning.

The Big Sky of Montana project is an excellent example of cooperation between developers of a private recreational complex and agencies of federal, state and local governments. This department has worked closely with the Big Sky planners to assure that the development is on a sound basis to maximize benefits and minimize environmental impacts. An outgrowth of the Big Sky project has been the establishment of the Gallatin Canyon planning study to provide a guideline for future land use for the entire Gallatin Canyon. This is one of the initial examples of regional planning in Montana that has involved a number of governmental agencies working with private citizen groups and local businesses coordinating their efforts to develop a well planned section within Montana.

The department has likewise worked with the Montana Highway Commission to provide an efficient transportation facility capable of meeting the recreational and employment needs of the development as well as responsive to all environmental considerations. A review of the Highway Commission proposal alternatives has been conducted, discussions held with Highway engineering personnel, and the route alternatives reviewed in the field. A review was conducted of the Highway Department preliminary estimates of road length, average grade, maximum grade, maximum fill-height, maximum degree of curvature, total deflection of alignment, average degree of curvature, cubic yards of excavation, and slide areas.

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Memorandum
April 21, 1972
Page 2

The departmental findings are as follows:

GRADE: Alternatives D and E were found to be least desirable with grades of 10% and 8.8%.

MAXIMUM FILL HEIGHT: Based upon maximum fill height alternatives A and D were found least desirable with fill heights of 85 and 90 feet.

CUBIC YARDS: Alternatives C, D and E are 50% or greater in cubic yards of evacuation than alternatives A and B.

SLIDE AREAS: Alternative A crosses an old slide area.

OTHERS: Length of road, total deflection of alignment, average and maximum degree of curvature were given less consideration than the first four physiographic considerations.

Alternatives D and E were initially eliminated based upon average grades (4.57% and 5.38%) and maximum grades (10% and 8.8%). Alternative A was next eliminated based upon a major unknown, the crossing of an old slide area.

The first major fill area on alternative C is located in a conspicuous area as seen from the existing meadow village and is esthetically in conflict with Big Sky's master plans. Although alternative B's maximum fill height is 75 feet, or 16 feet higher than alternative C, it is located in an inconspicuous location and does not conflict with any known planning. The total cubic yards of evacuation of alternative C with 782,000 cubic yards is almost 50% greater than that of alternative B with 548,000 cubic yards.

Based upon the previous analysis, alternative B is recommended by this department as the best location for the proposed highway center line.

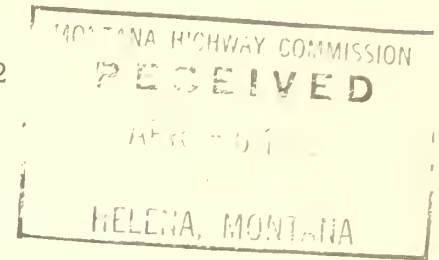
General: The items discussed are covered in the final statement.

UNITED STATES DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

P. O. Box 970, Bozeman, Montana 59715

April 4, 1972

Mr. H. J. Anderson
Director of Highways
Montana Highway Commission
Helena, Montana 59601



Dear Mr. Anderson:

We have reviewed your draft environmental statement for the project F-20(1) U. S. 191 Spur on the West Fork of the West Gallatin River about midway between Bozeman and West Yellowstone, Montana. We have the following comments for your consideration:

1. A statement to the effect that contractor work limits will be confined and controlled to provide for a minimum of disturbance of areas outside of roadway would add strength to the impact statement.
2. On page 13, second paragraph from top should read "Montana State University and USDA, Soil Conservation Service scientists..."
3. On page 17, we recommend that "by bulldozing" be deleted from the second line. Other exploratory methods may be more practical and palatable in light of environmental concerns.
4. On page 22 under No. 7 Fish and Wildlife -- add bighorn sheep as a major species of wildlife.
5. Would it be proper to assess probable adverse environmental impacts "external" to the spur to Highway 191 and hazards associated therewith? Do planners foresee a necessity to widen and improve Highway 191 to reduce hazards, or can traffic controls such as speed limits, weight limits, and etc. be enforced to reduce hazards?

Sincerely,

A. B. Linford
State Conservationist

cc: Kenneth E. Grant, Administrator, SCS, Washington, D. C.
Dr. T. C. Byerly, Coordinator of Environmental Quality
Activities, Office of the Secretary, USDA,
Washington, D. C. 20250



1. This information has been added under "Impacts on the narrow band adjacent to the project".

2. Page 13: The suggested change has been made.

3. Page 17: The information on page 17 is part of a quote and it has not been changed. The road project will not be built in the area of the possible rock glaciers, therefore, our interest in them lies only in understanding the past geologic history of the area. Where there is possible conflict with Big Sky facilities, they are investigating these formations.

4. Page 22: The Bighorn Sheep has been added as a major wildlife specie of the area.

5. Some of the effects on U.S. 191 are discussed in the draft under "Highway Facilities". No major reconstruction is anticipated on U.S. 191 in the next 20 years, although minor safety improvements may be made. Speed limits can be established on sections of roadway by the Montana Highway Commission if warranted by existing conditions. Weight limits are normally imposed to protect the structural stability of the roadway.

*Gallatin River**Project of West Fork Gallatin River*

703 West Mendenhall
April 12, 1972

Mr. H. J. Anderson, Director
Montana Department of Highways
Helena, Montana 59601

Dear Mr. Anderson:

SUBJECT: Draft Environmental Statement Project F-20(1) US 191 Spur-
West Fork Gallatin River, Montana-P.L. 91-190 Sec. 102(2)(C).

We appreciate the opportunity to comment on your Draft Environmental Statement and road alignments.

Apparently the important decisions regarding need and finance for the road have already been made by state and federal officials. The citizen participation appears limited to preferred location within a predetermined corridor and comments on the Draft Environmental Statement.

We have no preferred alignment within the corridor. Our concern is that one common error of road construction in the mountains of the west is to destroy many scenic assets with road scars. We hope this has been corrected. We also suggest it would be more equitable if Big Sky, Inc. built the road (meeting state standards) to the base of Lone Mountain and gave it to the state to maintain.

The Draft Environmental Statement is largely limited to a section of road for immediate construction with funds already approved. Statements should be available prior to project approval, not after, as this appears to be. The intent of P.L. 91-190 and guidelines indicate that the total long-term effects of all activities which will likely result must be analyzed prior to approval.

The overall impact of vehicular traffic and demand for road improvement in other locations should also be reported in more detail. For example, the extension of the road to Ennis is merely mentioned by saying there is support for it. It does not state there is also opposition to this road extension. Nor does it include those environmental impacts. Also, the possible future increased traffic on Highway 191 is ignored beyond 1992 ADT projections. Increased traffic from Big Sky will in turn increase pressures and needs for improvements in the narrow canyon portions of Highway 191 alongside the Gallatin River, a trout fishery of National Significance. This would have some predictable consequences on this valuable trout fishery. These are two examples of the error of trying to confine environmental impact studies to individual segments of a road being considered for immediate construction. This must be rectified in the environmental statement.

The Fish and Wildlife environmental impacts analysis are inadequate, lack documentation and are impossible to accept from the viewpoint of

people concerned about fish, wildlife and environment. For example, how much scientific documentation can be offered to support such general statements as:

Some adjustments in the patterns and behavior of wildlife in the area can be expected. Although not as important as some other areas in the Gallatin, the West Fork does support a variety of wildlife species. Their adjustments will vary, with some species avoiding the area and others being attracted to it for one reason or another. (page 26)

Little mention is made about the presence or absence of animals, birds, fish, rare or endangered species, and their relationships to roads and year long people activities as the result of roads. A brief survey among our members and published information show the following wildlife using the West Fork drainage: elk, moose, mule deer, bighorn sheep, mountain goat, black and grizzly bear, blue and ruffed forest grouse; and in addition there are numerous other birds and small mammals.

Areas accessible to motor vehicles the year around are generally not used by some important game animals unless the area is densely forested or certain weather conditions make it necessary for the animals to forage near the roads in the open. Elk, mountain goat, bighorn sheep, and bear require habitat with wilderness type characteristics. Roads, commercial developments and year long activities effectively stops production of these species in a much larger area than that occupied by the road and commercial developments. To imply the animals will merely avoid the area and live happily in another part of the forest shows you have not considered the already known information on population dynamics and ecology of natural wildlife populations. The environmental statement will not be acceptable until there is a credible ecological analysis for fish and wildlife in relation to the entire road, and to the entire surrounding area influenced by the road and subsequent developments.

Several investigations concerning elk, economics and recreational development in the Gallatin area are completed or underway. However, this information does not appear to have been incorporated into this draft.

Sincerely,



Everett A. Keyes, Vice President



Perry Nelson, Chairman
Natural Resources Committee

General: The final decisions regarding need and financing for the road have not been made to date and these decisions will not be made until this environmental statement has been filed with the responsible state and federal officials and until the location is approved by the Montana Highway Commission and the Federal Highway Administration. Citizen participation has been solicited through distribution of the Draft Environmental Statement, the location public hearing and a yet-to-be-conducted design public hearing.

The design standards and proposed alignment have been developed with the objective of reducing road scars to a minimum consistent with a safe, usable highway facility. Scars are inevitable in highway construction. However, through proper backslope design, topsoil replacement and the latest revegetation techniques, the impact on the scenic assets of the area can be minimized.

The construction of a private road to a public facility is not consistent with the objectives of the Montana Highway Commission or the Federal Highway Administration. Roadways for the use of the general public are a public responsibility and are financed with monies paid in road user taxes by those people who use the roadway. Although the Big Sky resort area will generate the majority of the traffic using the roadway, other owners and public domain lands will also be served.

The procedures being following in the development of this project are no different than those used on other similar projects. A logical sequency of steps are being followed in accordance with state and federal laws and procedures developed pursuant to these laws.

The fact that there is opposition to a road extension to Ennis has been added to the text of the final statement. Those impacts that can reasonably be anticipated to occur as a result of this project have been discussed. These impacts do not include reconstruction of U.S. 191 or the need for an extension to Ennis.

It is true that general statements are made in regard to wildlife resources and little scientific documentation can be offered to support these statements. However, many of the effects cannot be measured quantitatively and we must rely on the opinions of those people who have knowledge and expertise in this area.

The study being conducted by Montana State University in cooperation with the National Science Foundation entitled "The Impact of a Large Recreational Development Upon a Semi-Primitive Environment: A Case Study" may provide much more scientific information in this regard. The study will cover a time period which will enable researchers to measure the before and after situations. The most recent report on this study is included as Appendix C of this environmental statement.

426880N
MONTANA HIGHWAY COMMISSION
RECEIVED
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April 5, 1972

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Mr. H. J. Anderson
Director of Highways
Montana Highway Commission
Helena, Montana

Dear Mr. Anderson:

Re: Project F-20(1), U. S. 191 Spur, West Fork of West
Gallatin River Highway Spur (Big Sky)

Thank you for the copy of the Draft Environmental Statement on the subject project. We appreciate the opportunity to comment on it, and we forward our comments as an enclosure to this letter.

Sincerely yours

Albert G. Melcher, P.E.
Director of Technical Services

AGM/gy

Enclosure: Comments on Draft Environmental Statement, Project
F-20(1), Montana Highway Commission

cc: Assistant Secretary for Environment and Urban Systems, DOT
The Honorable Russell Train, Chairman, CEQ

ROCKY MOUNTAIN CENTER ON ENVIRONMENT
4260 East Evans Avenue
Denver, Colorado 80222
(303) 757-5439

COMMENTS ON
DRAFT ENVIRONMENTAL STATEMENT

"BIG SKY HIGHWAY"

PROJECT F-20(1), U. S. 191 Spur

WEST GALLATIN RIVER VALLEY, MONTANA

by

Albert G. Melcher, P. E.
Director of Technical Services

I. General Comments

1. The forwarding letter states: "In accordance with Public Law 91-190, Section 102(2)(C), the State of Montana, Department of Highways has prepared a Draft Environmental Statement for the subject project." In a recent decision, Greene County Planning Board vs. Federal Power Commission, (No. 71-1991), the U. S. Second Circuit Court decided that environmental statements filed in accordance with NEPA must be prepared by the responsible Federal official. A Federal agency abdicates its responsibility if it allows a non-federal agency or person to prepare a draft or final environmental statement for it, and such a statement is invalid. We are of the opinion that this dictum is applicable to projects involving the U. S. Department of Transportation, as does Project F-20(1), U. S. 191 Spur. Therefore, this Draft Environmental Statement should be prepared by the U. S. Department of Transportation.
2. The forwarding letter referred to above states that a 45-day time period is allowed for submittal of comments on the draft statement. The Guidelines dated April 23, 1971, of the Council on Environmental Quality, in Section 10(b), state: "To the maximum extent practicable no administrative action subject to section 102(2)(C) is to be taken sooner than ninety days after a draft environmental statement has been circulated for comment." The purpose of this provision is to allow adequate time for review and comment. The 45-day period allowed by the Montana Highway Commission is not consistent with the CEQ Guidelines; a new 90-day period should be established for comment on the draft environmental statement when it is prepared and released by the U. S. Department of Transportation. DOT 5610.1A also requires a 90-day period for comment on draft environmental statements.
3. The "Introduction" of the Statement is: "The purpose of this statement is to assure that the human environment is carefully considered and national environmental goals are met when developing federally financed highway improvements." This is a direct quote from FHWA PPM 90-1. It is a more limited purpose than NEPA, Section 101; hence, an appraisal of the environment consistent with the "Introduction" and PPM 90-1 may be

less than consistent with NEPA. Some of the weaknesses in the draft environmental statement are attributable to this limited purpose and perspective. We urge the drafters of environmental statements to take the broader viewpoint of Section 101, NEPA, in this and all cases.

4. Compliance with the intent of NEPA involves the question of allocation of resources among various alternatives. These resources include the allocation of the limited fiscal resources of the Federal Government. We have no basic quarrel with Section 127 of Public Law 91-605 amended Chapter 1 of Title 23 USC with added section 143, establishing demonstration projects for economic growth centers. Nor do we disagree with the criteria for selection of such economic growth centers, as promulgated in FHWA Instructional Memorandum 50-6-71, PP-10, dated July 12, 1971, EXCEPT FOR ONE MAJOR DEFICIENCY, namely: environmental matters are not enumerated in the criteria.

Accordingly, we feel that PP-10 itself does not comply with the intent or letter of NEPA. The national environmental goals as specified in NEPA must be as fundamental to the selection of economic growth centers as economics are. Otherwise there is no way to comply with NEPA, to maintain environmental quality, and to protect the welfare of future generations. The compliance of PP-10 with Section 2(b) and (c) of Executive Order 11514 appears to be marginal.

We support efforts which will stabilize existing rural populations and will prevent the exodus of rural citizens to urban areas. We concur that national resources should be allocated to that end. However, such resource allocation should be devoted to projects which will result in minimum environmental disruption or degradation, and if possible, in enhancement of presently deteriorated areas. The latter possibility exists in many rural areas where the declining economic base prevents resource allocation to sewage treatment, visual clean-up, soil conservation improvements, etc., etc.

In this case, we question that allocation of limited Federal financial resources to project F-20(1) is the wisest use of funds. There are undoubtedly other potential growth centers which should have higher priorities than project F-20(1) in terms of the criteria of PP-10 and a proper environmental evaluation as required by NEPA. This allocation is especially questionable when, as the draft environmental statement admits, private funds would be used to construct the road anyway. Only \$914,000 is authorized for FY 1972 for the entire state of Montana for economic growth center demonstration highways. The draft environmental statement offers no information on alternatives for financial resource allocation to other possible economic growth centers. A number of such centers have been proposed by the Montana Department of Planning and Economic Development. Some of these could possibly lead to real environmental enhancement and enhancement of the quality of life for more people. This would be ascertained if PP-10 did not have the major defect as noted above and if the examination of alternatives as required by NEPA had been conducted prior to identification of project F-20(1) as the best use of funds.

In previous correspondence with Mr. Francis Turner, Federal Highway Administrator, ROMCOE questioned the designation of economic growth

centers prior to, or without, environmental statements. In a reply by Mr. R. R. Bartelsmeyer, Deputy Administrator, FHWA, ROMCOE was informed that FHWA does not consider the designation of an economic growth center as eligible for additional Federal highway funding as an administrative action requiring an environmental statement. "The FHWA is not actually committed to a Federal-aid highway improvement until location approval." The draft environmental statement does not identify the reason for its existence, i.e., it does not state that it is accompanying a location approval application, funding application, or whatever. In this respect, it is misleading. Furthermore, the designation of this road as a primary spur in April, 1971, and as an economic growth center demonstration project in August, 1971, constitutes certain precommitments prior to a NEPA evaluation. If it is found, as the result of a proper environmental evaluation and evaluation of alternatives, that the proposed federal subsidy is not appropriate, will the primary spur designation be withdrawn, and will the economic growth center demonstration project be cancelled?

The entire draft environmental statement reads as if the only question left is one of alternative alignments. ROMCOE submits that that approach is not consistent with the letter or intent of NEPA, that there should be a proper Federally-prepared draft environmental statement, that there should be a full review of alternatives in allocating fiscal resources to economic growth center demonstration projects, that there should be a 90-day period for comment, and that the primary spur and demonstration designations must not be considered as commitments to administrative action.

5. It is noted that the Second Circuit Court, in Greene County Planning Board vs. Federal Power Commission, commented that draft environmental statements are to accompany a proposal through the review process. In this case, it would seem apparent that the review provisions of Office and Management and Budget (OMB) Circular A-95 are applicable. The comments of the Department of Housing and Urban Development will be especially relevant in the OMB A-95 review. This is because there are many programs and concerns of HUD which are affected by economic growth centers, and the proper development thereof. Sewer and water supply grants, educational assistance, welfare to low-income persons, health programs, and many other factors are included in the process of regional growth. The creation of a new center should be of extreme interest to HUD, and HUD should make detailed comments on the prospective involvement of HUD-administered programs.

Unfortunately, the data supplied on demographic and local governmental factors is too sparse to enable HUD to comment properly. "Off-site" impacts of mountain recreation developments are significant. This is especially true of the aspects of human welfare. Adequate housing, meeting appropriate standards and within the financial means of lower-income employees, is an especial problem. Unless FHWA assumes that a primary spur highway will solve the housing, educational and health problems of 300 employees by itself, the proposed solutions to these problems (and the environmental aspects of them) should receive HUD comment prior to the commitment of Federal funds to this proposed project. Only one-sixth of these residents will be housed within the "Big Sky" economic growth center itself.

FHWA Policy and Procedure Memorandum 20-8 requires the identification of the impact of a highway project on these social elements (and on many more elements). PPM 20-8 requires that these be presented at the public hearing on corridor approval. The draft environmental statement, and the Forest Service final environmental statement referenced by it, do not treat the various matters covered by PPM 20-8.

Further pursuant to this subject, the draft environmental statement briefly mentions (on p. 2) that there will be an economic impact of the development which will be felt by a large area of southwestern Montana. The impacts will be positive for some people, negative for others: taxes will rise, school buses will be needed (there are no school buses now to Ophir School), etc. There should be a systematic, interdisciplinary analysis of these benefits and disbenefits prior to Federal decisions, as required by PPM 20-8, OMB A-95 and NEPA (as stated in Paragraph 6(a)(ii) of the CEQ Guidelines). It is unfortunate that this project was selected for a geographic area which is so deficient in adequate land use planning and controls.

Selection of this particular demonstration project is in minimal compliance, if any, with some of the requirements established by FHWA itself in PP-10 for regional growth centers. In Attachments B and C thereto, criteria and definitions are provided. Especially, the center is to provide regional services such as health care, education, cultural activities, and other public and community services, according to the FHWA criteria. Indeed, this factor is stressed by FHWA. The Big Sky growth center will employ commuters (50% of the employees), it will have to attract in-migrants rather than serving an existing population base, and it is highly improbable that it can provide the services stressed by FHWA for many years. The history of similar developments would substantiate this.

Future government of privately-owned developments must be considered. How long will it be before the town becomes self-governing? What plans and provisions have been made for this? It does not make sense to put public funds into a private regional growth center which will not become self-governing, where the residents are disenfranchised. Such an approach is subsidizing a benevolent dictatorship, but has nothing to do with democratic government. There is a problem in this case because the prospective town will have so few permanent resident employees.

Further pursuant to this topic, this economic growth center has been selected in an area where land use planning and controls are minimal. Despite the policy of the Federal Government since 1954 to use HUD 701 funds for planning, and despite many other Federal policies and statements concerning the need for improved land use planning (such as the study of the Public Land Law Review Commission), FHWA has chosen to ignore this factor. This is another weakness of the criteria of PP-10. Efforts to develop planning and land use controls will never succeed if they are subverted instead of reinforced by Federal actions. Neither local nor regional land use planning or controls are adequate in this case. Unnecessary environmental degradation is therefore inevitable.

6. The draft environmental statement references the Forest Service final environmental statement, but does not include it as part of the distribution. Fortunately, ROMCOE had previously received it. Otherwise it would be difficult to comment on this draft environmental statement, especially in the time allotted.

II. Specific Comments

1. P. 2: "The economic impact of this development will be felt by a large area of southwestern Montana." Pp. 20-22 expand somewhat on this sentence, but explicitly admit that studies are not complete. This draft environmental statement is premature in that it does not make the assessments of the primary and secondary effects of population changes upon the resource base, as required by the Guidelines of the CEQ. We do not feel that it is adequate for an environmental statement to say that studies will be, or are being, made.

The change upon the regional economy will include costs and disbenefits; certain taxes will undoubtedly increase, and there may be on-going demands for public funding. These should be identified; the Montana State University study has started this.

2. P. 2 and 3: It is stated that without a Federal-aid highway spur, the highway will be a low-type road without adequate environmental protection. This is the "do-nothing" alternative in the statement. It is also discussed on p. 32. This implies that the developers are not concerned with environmental quality and that they and the Big Sky customers will accept a low-type, low-quality road. To do so would obviously not be in the developer's best interests. Further, are there no adequate county subdivision or other standards which would ensure that the road will be properly constructed if not on the Federal-aid system?
3. P. 2 mentions an increase in air pollution during construction. There will be a permanent increase in air pollution resulting from operations on the road. The National Science Foundation study mentions that inversions can last for days in this region. The draft environmental report should estimate the pollutant load, and compare it with air quality standards, for a fully operational status of the development. The discussion should include particulates, hydrocarbons, photochemical oxidants such as PAN, and carbon monoxide (which is formed in larger amounts by internal combustion engines at higher altitudes and is a greater health problem).
4. P. 3 discusses alternatives. This misses the intent of NEPA completely, as discussed under "General Comments" above.

Even in terms of movement of goods and people between the two villages, other alternatives exist utilizing a "service road" for construction and permanent service, with movement of people by bus or transit (such as funicular or aerial gondola). The long-term advantages of this might be significant in terms of environmental quality. DOT should investigate it prior to funding any one mode of transportation.

A most important consideration of the alternative of no Federal-aid highway is that of prospective future extension, as discussed below in Comment II-7.

5. P. 3 and p. 26 discuss wildlife, but the discussion is completely inadequate. There has never been adequate study of wildlife of the region, even in the Forest Service environmental statement. The adjacent area north and west is very rich in wildlife, including rare and endangered species, and there appears to be evidence that the habitat of some of these species includes the West Fork. If the total habitat is diminished, does the carrying capacity exist in the adjacent areas for the displaced species? This type of information must be discussed in an environmental statement.
6. P. 23 discusses traffic counts. Big Sky anticipates 3,000 visitors per day by 1980. Assuming four persons per car (a high figure) and 1.5 trips/vehicle/day, 1125 additional vehicle trips will be added to U. S. 191 by 1980. This does not include employee trips. It does not include trips generated by new land uses fostered by the presence of the Big Sky development (see Montana State University for comments on changing land uses). It may well be, then, that the ADT on U. S. 191 may exceed 4400 before 1992, and four-laning may be required.
7. Pp. 24 and 25 discusses the possibility of an extension of the primary spur westward to U. S. 287. This is a major consideration, and should not be excluded from the environmental statement, as is done on p. 25. The Guidelines of CEQ state: "In considering what constitutes a major action significantly affecting the environment, agencies should bear in mind that the effect of many Federal decisions about a project or complex of projects can be individually limited but cumulatively considerable. This can occur when one or more agencies over a period of years puts into a project individually minor but collectively major resources, when one decision . . . is precedent for action in much larger cases or represents a decision in principle about a future major course of action, etc."

This primary spur is of the "creeping fait accompli-ism" variety. If this project is approved, there should be positive and irrevocable guarantees that any future extension to U. S. 287 will be located south of Lone Mountain, and will not intrude upon the Jack Creek drainage. We emphasize the importance of this. The reasons are: wilderness, aesthetics, physiography, unsuitability for road construction (due to high-altitude wetlands), and wildlife, including rare and endangered species.

This matter must be handled prior to a decision on U. S. 191 Spur, as per the CEQ guidelines. The Jack Creek area might be considered to qualify as "Section 4(f)" land under the DOT Act of 1966. PP-10 also requires study of an entire corridor, not just a portion of it.

8. P. 27 states that there are no 4(f) lands in the project area. Apparently the Montana Highway Department has requested a change in the southern boundary of the Spanish Peaks Primitive Area. This constitutes an impact on a Section 4(f) land. There are feasible and prudent alternatives to boundary changes, it appears.
9. P. 32 discusses the relationship between short-term uses and long-range productivity. The discussion is inadequate. The statement mentions the significance of land use in the decision-making process of designation of economic growth center demonstration projects and Federal-aid highways. It does not discuss the considerations of Section 102(2)(C)(iv) properly. Watershed and downstream water physiography and quality are subtly altered

by incremental land use changes, thereby diminishing long-range productivity and environmental quality, possibly requiring river channel modifications or flood control projects. Forestry productivity, agricultural land conversion, and other factors are involved. We recognize that these can't be quantified at this time, but they can't be ignored.

10. Enclosed as a part of this Comment are earlier ROMCOE comments on the Big Sky development.

REVIEW OF BIG SKY, MONTANA ENVIRONMENTAL REPORTS

General Comments:

At a time when most environmental leaders and increasing numbers of political spokesmen consider irresponsible land use and land development as the major environmental problem of the Rocky Mountain Region, the Big Sky report is indeed encouraging. On the surface at least, it appears that Big Sky will be perhaps the first major land development in the West that will have made exhaustive environmental studies prior to making irretrievable development decisions.

There are two overriding concerns that apply to the entire report and its recommendations: (1) that "solutions" to environmental problems sometimes create other problems as serious as the ones they were intended to solve; and (2) that the model planning -- maximum environmental protection measures and all the best intentions of the present developers -- could be vitiated by their successors or assigns. This would be likely to happen only in the event of a transfer of Big Sky to new owners. A major change in the makeup of the Board or the management of Big Sky could revolutionize the philosophy and approach of the development overnight. On too many land developments, the plans and intentions of the original developers have been canceled out by their successors, with the public and the land as the losers. Short of transfers of the undeveloped lands of Big Sky to public ownership, what guarantees are there that the original plan for development, of which 8,298 acres is to be left in "open space," will be carried out?

The specific comments below are made without benefit of an on-site inspection of the property as well as without benefit of the report exhibits including the Master Plan. Thus unavoidably such a review is somewhat superficial.

Specific Comments in Chronology of the Report

1. The Introduction states that the report "does not purport to consider the environmental impact of the remaining lands included in the land exchange." Obviously, no "environmental impact" analysis can be complete without structuring an ecological statement for the entire area to be affected, on-site and off-site. Apparently, this deficiency is being corrected.
2. The Introduction also states that most of Sections 30, 32 and 36 will be limited in development to ski lifts, trails and associated improvements. Without the Master Plan (Exhibit "D" not available), it is impossible to determine what the "associated improvements" might be. Do these improvements include warming houses, ski rental and repair, lodging facilities and condominiums?
3. The Report emphasizes the minimal development aspect of the project; that only 2,350 acres out of 10, 648 acres will ultimately be developed. The balance of the acreage, 8,298 acres, is to be left "untouched" and in a "natural state." This is of course a laudable objective. However, what are the legal protections against changes of philosophy of the present Big Sky management (e.g., selling off lots to recoup investment capital), different approaches if ownership changes, etc?

Board Chairman Chet Huntley apparently recognizes this problem. In discussing the desirability of the Burlington as an adjacent property owner, he states: "While

it is true that a company such as the Burlington Northern Railroad might be sensitive to public opinion, another owner of that property might have no such sensitivity. We cannot expect the private sector to pay taxes on land and simultaneously reserve it as a public park or wilderness area or recreation facility. The only guarantee that areas such as the Hyalite district and Yellowstone Park will serve the public interest for perpetuity is public title to them." (Emphasis added.) Huntley admits that this also applies to the investors in Big Sky.

More cynical environmentalists have a feeling that the real estate sales office always wins, no matter what the Master Plan calls for. The Sea Ranch on the northern California coast and Snowmass-at-Aspen are only two examples of major developments which have abandoned well conceived and environmentally responsible master plans the moment it was felt necessary to recover some "front end" money. It is not clear from the report why Mr. Huntley feels the Board of Big Sky would be willing to maintain a "privately endowed public park" providing only that the land exchange is approved. To the contrary, he makes a rather good case for the 8,298 acres remaining in public ownership as a "buffer" for the Big Sky development to protect the investment of Big Sky and the public interest.

Suffice it to say that some guarantee of future protection for lands that are intended to be left in a natural state must be created. Short of transfer to the Forest Service (which might then continue clear-cutting the area with resulting scenic, recreation and wildlife disruption), scenic or conservation easements might be transferred to the county, Montana Fish and Game or a private, non-profit corporation such as The Nature Conservancy (depending on the various legal authorities of the agencies, possible attendant tax benefits to Big Sky, etc.). In fact, an outright tax-deductible gift of all or part of the 8,298 acres to The Nature Conservancy would assure both public benefits from environmentally responsible use of the property (hiking, nature study, environmental education, etc.) and protection for Big Sky developments from future encroachments.

We have no reason to doubt the present intentions or the veracity of the present Big Sky management. Rather, we fear that unforeseen circumstances and changes of ownership might undo the very best of intentions in the future.

4. (Meadow Village). With the exception of Section 15, the protective covenants for Meadow Village appear to be excellent in concept and drafting, particularly Section 3 (Architectural Committee) and Section 9 (Environment). The problems will lie in implementation and enforcement. First, the covenants require merely that at least one member of the 5-member Architectural Committee be an architect. Second, no committee or other review entity is responsible to carry out the intent of Section 9 on protection of the environment. A property owner must go to court if every attempt is not made to preserve the environment of Meadow Village. Third, the "protectiveness" of many covenants has often proven to be illusory when property owners have attempted to enforce them. A thorough examination of the Montana cases should be made to assure as much as possible that the covenants are enforceable as drafted. While a complete analysis of the covenants is not possible for this brief review, at least the following amendments should be made immediately: (1) Section 3 should provide that at least three members of the architectural committee be architects, landscape architects or artists (painters, sculptors, etc.); (2) either the Architectural Committee or a separate Environmental Committee composed in part of biological scientists should be empowered by the covenants to enforce Section 9. In other words, a team of "ecological inspectors" should have authority to review construction plans, inspect construction as it proceeds and be able to "stop the bulldozer" if necessary to protect

the environment until proper adjustments can be made, just as a building inspector can stop masons, carpenters or electricians. Tapio, Finland, for example, uses such an approach. An even more positive approach would involve short training and "awareness" courses for contractors and designers. The most precise environmental quality standards for construction can be violated with one careless slip of the bulldozer blade; (3) What the covenants give in Sections 1-14 seem to be taken away in Section 15, making the covenants at least in part an illusory protection. Assuming that Big Sky will be a majority land owner for some time, the ability of the owners of 75% of the land to amend, abandon, terminate, modify or supplement the covenants at any time can be interpreted to mean that the future of the covenants for some time is really in the hands of Big Sky or its successors. At the very least, this should be changed from "owners of 75% of the privately owned land" to "75% of the owners of the privately owned land." In addition, there should be requirements for notice to property owners, a property owners' meeting and other safeguards.

5. (Meadow Village.) While an on-site inspection would have to be made to make a final determination, it seems unlikely that a 200-foot "buffer strip" is adequate protection from conflicting developments along the roadside. After all, many city commercial lots are only 100 feet deep. Also, buffer strips or zones should follow natural vegetative patterns and topographic lines; they should not be established with arbitrary measurements.
6. (Meadow Village.) While again it is impossible to make a valid determination without an on-site inspection, two of the more common blunders in seasonal or recreational home development in the Rocky Mountain region are: impairment of scenic views and creation of esthetic insults caused by construction in open meadow lands; and creation of mountain home sprawl through establishment of too low densities. As a general rule of good design, not only esthetically but often from a construction cost standpoint, mountain homes should be confined to areas of available vegetative cover or topographic screen. Also, much more is to be gained in environmental protection by more intensive cluster-type development surrounded by open space and natural environmental amenities than by chopping a "sagebrush flat" area up into 12,000 square foot lots. Although we have not yet inspected the site or seen the Master Plan, the verbal description of Meadow Village appears to be a very unfortunate decision for Big Sky. It tends to put Big Sky in the run-of-the-mill mountain land development category that makes a visual blight of many beautiful open meadows which serve as foregrounds for mountain vistas. The fact that the homes will be expensive and well designed architecturally makes little difference. An "exclusive" subdivision in a mountain meadow can be as visually obnoxious as a trailer park. It is an understandable yet grievous error of much mountain development that low density per se is considered a desirable objective; this concept guarantees mountain sprawl.
7. (Meadow Village.) The report does not mention the kind of treatment or design intended for "parking accommodations" -- another prospective landscape blight. Vail, Colorado is perhaps one of the more notorious examples of how vast expanses of (expensive) parking lots can mitigate against good architectural plans. Underground or other structural parking alternatives are more expensive from the standpoint of short-range investment but they will pay off in the long term by making Big Sky one of the few resort developments (Sun Valley is another) not blighted by visual cesspools devoted to the automobile. (In fact, is it really necessary to allow automotive traffic on the interior of any of the Big Sky developments? Have all possible transportation alternatives, including walking,

been investigated 'so that visitors and property owners (excluding service vehicles) could leave their automobiles at the entrance to Big Sky?) Big Sky can distinguish itself among all American vacation resorts by how it handles that greatest of menaces to good development and design -- the automobile.

8. (Meadow Village.) The report states that "condominium sites must be landscaped" and that many areas will be "utilized for lawns." Why? Why cannot the natural vegetation indigenous to the area be restored around construction sites, including homesites, and left as is? (This was the original intent of the Sea Ranch development in northern California although the real estate sales office has since broken down the plan.) Why is it necessary for absentee property owners to transplant their Eastern "green lawn" culture and reduce the beautiful, native mountain landscape to some lowest common denominator? Why can't Big Sky distinguish itself in this respect also and ban lawns and other plantings of exotic materials? Must we always insist, in our ecological ignorance, in planting the palm tree on the tundra and the alpine fir in the desert?
9. (Mountain Village.) The report indicates that the Mountain Village site was selected primarily on the basis of topographic and climatic conditions, although this is not explained fully. If this is the case, studies leading to such a decision would of course be inadequate. Vegetative patterns and species, sub-surface and surficial geological structure, soils analysis, ground and surface hydrology, stream biology and other studies would have to be made before a really intelligent site selection could be effected. It is not clear from the report what other studies have been conducted or are in process. (Of course, a final site selection should not be made until such studies are completed.)
10. (Mountain Village.) Traditionally (if Big Sky desires to follow the land development conventional wisdom), natural stream alterations by diversions, impoundments, etc. are considered by land developers as an "enhancement," an improvement on the natural ecosystem. Such "enhancements" are not without their ecological consequences. For example, the fishery resource (other than put and take) is seldom if ever improved by a reservoir after the first 5 or 6 years when the food supply created by the inundation becomes exhausted. Recent studies by the Idaho Fish and Game Department have failed to disclose any stream alterations that have improved the fishery -- out of several hundred such alterations in that state. Reservoirs in the West generally face problems caused by unsightly drawdown in dry years, sedimentation collection and related problems. Again, the traditional approach with any vacation development in the West is to create another fishing hole, degrading natural stream fishery values in the process. Does Big Sky have to be so traditional?
11. (Mountain Village.) The exclusion of vehicular traffic from the commercial core of Mountain Village is of course laudatory. However, to assure that this is carried out, Mountain Village should be so designed and constructed as a pedestrian community that vehicular traffic becomes impossible without considerable and expensive reconstruction. This would protect the Village from a change in Big Sky management or new ownership.
12. (Service and Engineering.) While the water treatment system appears to be very well conceived, with commendable recycling of water and nutrients to the golf course, no mention is made of cold weather recycling operations or of the appearance and odor control of the primary and secondary treatment facilities.

The discussion of sanitary land fill would concern many environmentalists. Specifically, what is the supply of land for this purpose?; what are its geomorphological and geological characteristics?; for how long will suitable land be economically available for this purpose?; what are the potential problems with leaching, winter operations, and similar matters?

In backfilling utility trenches, care should be exercised so that drainage and existing permeability patterns are not disrupted. (Trenches can become either watercourses or subsurface dams if not properly backfilled.)

13. (Wildlife.) The discussion of wildlife impacts (Exhibit H was not attached) is inadequate from the viewpoint of either the concerned environmentalist or the professional wildlife biologist. How much data can be offered to support such flat statements as the area "is not a part of any migration route" or that it is not a winter range? How exhaustive have been the studies of Montana Fish and Game? If it is not now a winter range, what are the prospects of winter browse being created? For example, the importance of stream and river bottom lands for winter range is not discussed in the report.

The improvement of wildlife browse opportunities through restoration of clear cut slash areas is of course a commendable objective; 20 to 30-acre forest openings can considerably improve deer browse, for example. However, the ecologically limiting factor for deer and elk is the availability of winter range for which Big Sky might afford some prime resources.

The report made no mention of either the presence or absence of rare and endangered species. The nearby Spanish Peaks Primitive Area (proposed by conservationists as a 113,000-acre addition to the National Wilderness Preservation System) provides habitat for Bighorn sheep, mountain goat, moose, elk, deer, black bear and grizzly bear, as well as ruffed grouse, blue grouse, Franklin grouse, coyote, bobcat, lynx, cougar, mink, marten, weasel, skunk, badger, beaver, eagles and hawks, and numerous other small mammal and bird species. Several of these species are on the rare and endangered list of the Bureau of Sport Fisheries and Wildlife. What are the relationships between these species and the Big Sky development? Again, it does not make ecological sense to limit the wildlife study just to Big Sky itself. Relationships must also be drawn in terms of surrounding wildlife communities.

14. (Tests and Studies.) The numerous and apparently thorough investigations completed or underway on Big Sky environmental resources represent an effort far in excess of almost all major land developments in the country. However, it is not clear from the report how all of this data is being reviewed and coordinated into a meaningful and useful ecological statement about the areas proposed for development. Certainly, the collection of data is not an end in itself for a project like Big Sky; it must be utilized as a guide to responsible development and as a means of monitoring ecological change on a continuing basis. For this reason, it is critical that as much ecological data as possible be gathered about Big Sky so that valid base data can be developed before any significant development takes places. The ideal way to accomplish this would be to conduct a complete Environmental Resources Inventory and Analysis with a competent interdisciplinary scientific team that would be well coordinated. According to our information, such an Inventory may be in progress by the Montana State University under the direction of Dr. Charles Bradley. It is not clear from the report what the precise relationships are between the MSU and possible other university studies

and the Big Sky management. It would be unfortunate indeed if current studies were to turn out to be mere academic exercises with little or no effect on the Big Sky decision-making processes.

(Roads.) The plan discussed in the report to utilize existing roads and retire others by replanting is an extremely wise decision. Another common error of land developments in the mountains of the West is to destroy many scenic assets of an area with massive road scars up and down mountainsides and through the middle of meadow lands. Assuming their cooperation, Forest Service landscape architects could be extremely helpful with road location and design.

However, the overall impact of vehicular traffic should also be studied. Parking facilities problems were discussed earlier. Other major problems are: air pollution (with both known and unknown effects on vegetation) noise; safety hazards; visual pollution; and congestion problems. If such a study is conducted, careful distinctions should be made between summer and winter traffic patterns. It can be noted again that Vail, Colorado has failed to solve its winter parking and traffic problems; movement through the area is poor with frequent congestion. The proposed Mineral King development, with remote parking facilities and a transit train, appears to be a better solution.

Also, there should be some study of the effect of increased traffic loads on Highway 191 in the Gallatin Valley. Projections beyond 1980 should be made as part of the regional planning process. If increased traffic results from the Big Sky development, this will in turn increase pressures (and needs) for highway improvement, improved access to land in the Valley, etc. -- all with some predictable environmental consequences. This is another example of the error of trying to confine Big Sky environmental impact studies to lands controlled by Big Sky itself.

Matters Not Covered in the Report.

- a. Regional Planning and Land Use Control. The "off-site" impact of the Big Sky development on lands beyond the jurisdiction of Big Sky undoubtedly presents the gravest environmental hazard. The very presence of Big Sky is bound to generate irresponsible land use development: the leeches of our society will suck all they can from the presence of Big Sky, generally without regard to environmental quality. We are not convinced that this impact will be minimal or confined to a small area merely because Big Sky's immediately adjacent property owners are felt to be responsible (the ownerships of those properties can also change). While it is not the responsibility of Big Sky to solve this problem alone, Big Sky cannot ignore it. To apply an analogy from the law of tort, Big Sky can be said to be the "proximate cause" of much undesirable development that can take place in the Gallatin Valley. Thus it is the responsibility of Big Sky to serve as a catalyst to effectuate adequate regional planning and effective land use controls.

A rapid review of planning and land use legislation of the State of Montana does not completely reassure the environmentalist that the Gallatin Valley will have adequate planning and land use controls.

Cities and towns have good planning and zoning powers, but can only extent their jurisdiction for a very limited distance beyond town boundaries (Chapter 27, Section 11-2702 and 11-3830) unless so requested by the county commissioners.

Joint City-County Planning Boards are advisory, (Chapter 27, Section 11-3801) and do not have adequate powers and duties (Chapter 27, Section 11-3824).

The adoption of a Master Plan by county commissioners gives the commissioners authority over public facilities, utilities, subdivision controls and zoning. Upon advice by the Planning Board, county commissioners may approve the filing of any plat, although the criteria for review of filings are weak (Chapter 27, Section 3844). Disapproval of plats may be appealed to their District Court.

County Planning and Zoning Commissions consist of the three county commissioners, the county surveyor and the county assessor. This Commission reports to the county commissioners; it makes recommendations to the county commissioners, and is itself authorized to provide for issuance of permits for construction (Chapter 41).

The county commissioners are authorized to adopt district-wide zoning regulations. The zoning powers may create zoning districts and regulations governing construction and land uses. The county commissioners appoint a Board of Adjustment. Any "person aggrieved" or any officer, department, board or bureau of the county affected" may appeal to the Board of Adjustment. Further appeal is through the courts. Temporary interim zoning may be adopted by the county commissioners for a one-year period if a county is in the process of developing a master plan or zoning regulations. A one-year extension of time is also permitted (Chapter 47).

In summary, the following points stand out:

- (1) A regional planning commission should be established for the entire valley as an ecological unit. If necessary, special state legislation should be enacted for this purpose.
- (2) Current legislation is probably inadequate for the purpose of proper planning, zoning and building control in the Gallatin Valley.
- (3) There is no positive state involvement in planning or control.
- (4) The entire fate of the Valley, in practical terms, lies in the hands of three county commissioners, who make the decisions, serve as 3/5 of the Planning and Zoning Commission, and appoint the Board of Adjustment. (Throughout the West, county commissioners, many of whom consider land use controls as socialistic, have been the main stumbling block.
- (5) Additional land use controls, mechanisms and funds are needed: land acquisition by government, purchase of easements and rights, eminent domain, etc.
- (6) The legislature, or county if it has the powers, should create an Architectural Control Board for the Gallatin Valley.
- (7) Much depends, as regards environmental quality, on subdivision regulations and general administration of the laws. Weak subdivision

regulations and lax administration will cause considerable deterioration of the Gallatin Valley.

- (8) Additional information on county, state and federal ability to control sewage and septic tanks is needed; this is not covered in the planning and zoning legislation reviewed.
- (9) "Natural Beauty" is not recognized as an aspect of public welfare specifically in the planning legislation. nationally, many courts have held esthetics to be such a concern. It is hoped that specific attention will be devoted to this, from planning and legal points of view, by the county commissioners.

- b. Back Country Recreation. The Wilderness Society, a national organization dedicated to wilderness preservation, and Montana conservationists have proposed a 113,000-acre Spanish Peaks Wilderness, to include undeveloped portions of the Jack Creek drainage. There is also citizen concern about the future of the Taylor-Hilgrad "de facto" wilderness (approximately 150,000 acres) immediately south of Big Sky. Thus Big Sky is presented with an ideal opportunity to provide wilderness experiences for its guests. Rather than serving only the conventional summer recreational fare (pond fishing, golf, tennis, horseback riding, etc.), Big Sky should give serious consideration to providing "back country" hiking, backpacking, horse pack and horseback riding trips into nearby wilderness areas. Thousands of Americans spend several weeks each summer jammed in bumper-to-bumper roadside campgrounds; they have never had an opportunity for a wilderness experience. Big Sky, in cooperation with The Wilderness Society and other groups, could provide a tremendous recreational and educational experience for many people who otherwise would be confined to developed campgrounds. Environmental education programs could be a part of this program. Also, Big Sky should be joining with conservation organizations in promoting wilderness designation for these irreplaceable resources.
- c. Employee and Construction Housing. Big Sky should consider the provision or availability of adequate, properly planned and designed housing for employees and construction workers as a developer responsibility. Most resorts and ski areas totally ignore this problem. As a result, trailer courts and low quality housing spring up for 20 miles in every direction. Two examples: Aspen, Colorado ski centers and summer resort activity has served to foster unsightly trailer parks in the Roaring Fork Valley and in Aspen itself. Some of these resort service workers must depend on welfare checks part of the year, during "slow" seasons when many layoffs occur. A number of service personnel who serve Vail, Colorado live in Minturn, Colorado which can only be described as a rural slum -- carefully hidden away from the "rich man's resort." Big Sky cannot responsibly ignore this dual social-environmental problem. This may mean that Big Sky will have to supply service and construction worker quarters at reasonable rental fees rather than allow the Vail and Aspen patterns to be repeated in the Gallatin Valley.

Forest Service Draft Environmental Statement

- 1. Comments by other agencies: should include EPA, BSF&W and HUD, the latter as regards the question of regional planning. As this Statement notes (p. 29),

"Presently there are no zoning regulations in the Gallatin Canyon. Some of the current development points up a need for planning and zoning immediately."

2. The roads discussion is weak. The Forest Service comments on Highway 191 are more realistic than those of the Highway Department, which only projects to 1980. Access from Big Sky to the town of Ennis, west across the Divide, is ignored. (Burlington Northern plays a role in this.) Big Sky offers assurances that it "will cooperate with the Forest Service in every way, including access to [the Spanish Peaks Primitive Area]." Similar assurances from Burlington Northern would be desirable.
3. Air quality. Further study should be made. Aspen, Colorado is an example of auto-produced air pollution which is severe. Traffic counts in Aspen are comparable to those forecast for Big Sky by the Montana Highway Department.
4. The discussion of wildlife is inadequate and impossible to accept without further documentation.
5. Soil studies are underway. There is only one component of the complete study needed for proper environmental planning. It is unfortunate that Draft Environmental Statements are prepared before a proper Environmental Resources Inventory and Analysis is completed. Governmental actions, such as exchanges, should follow rather than precede proper environmental studies.
6. The acquisition by the Federal Government of the "Offered Lands" is a definite asset in this transaction. It raises the question, however, of whether these lands could be acquired by the Government in the future without this particular exchange being examined. This is discussed as Alternative No. 2.
7. It is unfortunate that there is not a large Forest Service "buffer zone" between Big Sky and the Spanish Peaks Primitive Area. Agreements should be developed prior to the exchange of land to provide for access, buffering and minimal intrusion of Big Sky-related development and activities on wilderness character and values.
8. The discussion of "Views of Others" (p. 66) merely states such views were obtained. It does not state what opposing views and data are pertinent to this exchange proposal. This must be rectified in the Final Environmental Statement. The discussion on pages 66-70 is not to be condoned.
9. Too many well-intentioned schemes fail to develop as planned because of economic reasons. The result is environmental degradation which is unforeseen. It seems that, prior to federal actions, a financial review of the proposed development is in order. Performance bonds should be required to ensure that implementation of development conforms to the glowing statements made in plans upon which the federal action is based.
10. The draft contains too many statements taken directly from the proposed developers. The Forest Service has not done enough independent and original work on this case.
11. There is no discussion of archaeology or historical sites, and protection thereof.
12. Attached is a list giving (a) factors used by the Regional Forester in Colorado in evaluating ski area permit applications and (b) additional factors which should be evaluated.

This list should apply in this case. All facets on it have not been evaluated. This Draft does not discuss climate, suitability for ski development and other relevant factors, which should be studied and a determination of suitability made before any Federal action occurs.

1. Snow cover -- number of months
2. Snow texture -- amount of dry snow per season
3. Snow depth -- feet, average per season
4. Adverse snowfall -- blizzards, etc.
5. Ice for ice skating
6. Vertical rise available for runs
7. Amount of slope suitable for beginner, intermediate, and expert skiers
8. Aspect of slopes -- north, east, etc.
9. Continuity of slopes, need for terrain changes.
10. Ground surface conditions -- rocks, vegetation, etc.
11. Slope protection from wind and sun
12. Winds
13. Air temperature
14. Avalanche hazards and control potential
15. Availability of electrical power
16. Parking and base area size.
17. Summer operation potential
18. Esthetic impact
19. Access -- roads, railroads, airports.

We would suggest some additional ecological and planning factors, as follows:

1. Impact on wildlife, especially on the habitats of rare and endangered species, and stream ecology.
2. Environmental factors of access -- ecological factors pertaining to highway improvements
3. Forest Fire hazard.
4. Hydrology -- effect on water from possible pollution, erosion, recharge of aquifers.
5. Proximity to wilderness areas, or outstanding natural areas.
6. Economics -- are development costs high and potential usage and income low? If so, the operator may not make it financially, or may be forced to cut corners and do a slipshod job. Or he may be forced to sell real estate to maintain a cash flow, where such real estate is not well situated environmentally.
7. Geology -- are surface soils and bedrock suitable for development -- are there unstable slopes, and so forth. fragile vegetation can be easily destroyed, and erosion will set in.

8. Public Facilities -- schools, medical, utilities, local government conduct and financing.
9. Regional Planning -- impact on growth (type and geographic character).

I. GENERAL COMMENTS

1. The Draft Environmental Statement and this Final Environmental Statement have been prepared in accordance with Federal Highway Administration Policy and Procedure Memorandum 90-1. These instructions apply to all federal-aid projects nationwide and they will be followed until they are changed by proper authority.
2. A 90-day period is not required for the interagency review of the Draft Environmental Statement. A 90-day period is required prior to any "administrative action" which, in this case, is Federal Highway Administration location approval. This allows time for preparation and review of the Final Environmental Statement prior to the granting of location approval.
3. The "Introduction" is considered to be a proper statement of the objective of the report and it has not been changed.
4. The West Fork area has been submitted as an economic growth center and has been approved as such in accordance with IM 50-6-71. It is presently the only approved growth center in Montana.

Approval of the primary spur designation and the economic growth center are not considered to be administrative actions requiring environmental statements. If

this project is determined to be ineligible for federal-aid primary funding, the primary spur designation will be withdrawn. Also, if the road is not eligible for primary funds, then no demonstration project could be funded to construct the spur. This does not mean that the economic growth center designation would be withdrawn, as there could be other primary projects that would qualify.

5. The procedures for clearinghouse (OMB Circular A-95) review and approval are being followed.

The Draft Environmental Statement has been furnished to the state clearinghouse and the Final Environmental Statement will be furnished to them.

Every city and county in the nation is faced with problems in the areas of sewer and water supply, education, welfare for low-income persons, health programs and housing. An Environmental Statement for a highway project cannot solve all these problems. It does provide a description of the area involved and the changes it is undergoing. It describes the impacts associated with the road and the measures to be employed to minimize these impacts. In this particular case, there is a study of the combined effects being made by Montana State University, but this is not the case in most instances.

6. The U.S. Forest Service Final Environmental Statement was not included in the distribution of the draft statement because of its size. This statement is available from the National Technical Information Service, U.S. Department of Commerce, Springfield, Virginia 22151. In accordance with the National Environmental Policy Act, it was made available to the public and the Council on Environmental Quality on July 1, 1971.

II. SPECIFIC COMMENTS

1. The information on pages 20-22 is quoted from the Montana State University Study and describes the data gathering to project baselines in the absence of the Big Sky resort development. Their study is of a continuing nature and will measure, scientifically, the impact of this development and will provide statistical information to guide future developments. Throughout the ROMCOE comments, statements are made to the effect that the environmental statement is inadequate and not in accordance with laws and regulations. We do not agree with these allegations. Much of the information is general in nature, however, so are many of ROMCOE's criticisms. Only through studies such as the one being conducted by Montana State University, can quantitative and qualitative information be obtained.

2. It was not meant to infer that the developer is not concerned with environmental considerations. To the contrary, their statements, planning and actions to date indicate that they are and the success of their development requires that they must be. However, the cost of road construction is high and it is doubtful that they have the expertise that the Department of Highways has when dealing with the environmental problems associated with road construction. If not on the federal-aid system, there are no standards that would dictate how the road would be constructed.
3. The permanent increase in air pollution in the West Fork drainage will be minimal. The area is so large that a development the size of Big Sky and the automobiles utilizing the roads and streets in the area will not be of any significant consequence. The inversions that occur last for two or three days and then the prevailing westerly winds carry stagnant air out of the area. Both Montana law and Big Sky's restrictive covenants prohibit open burning. New federal pollution standards for automobiles regulate the exhaust emissions from cars. The elimination of logging operations and the resultant slash burning will remove this source of pollution.
4. The use of helicopters, gondolas, air cushion vehicles or other exotic modes of transportation are not covered in more detail because of the expense involved, the lack

of ability to finance such systems, their inability to carry heavy loads of materials and supplies and the fact that these systems would also have adverse impacts on the environment of the area. It is anticipated that considerable bus transit will utilize the proposed roadway.

5. We are not aware of any endangered species in this area.
6. The traffic figures and projections for U.S. 191 as presented on page 23, have been developed based on past experience and knowledge of future development. They are considered accurate and take into consideration all traffic generated by Big Sky and other land use changes as well as normal traffic increases expected for a highway of this type. No change has been made to the figures presented on page 23.
7. The Montana Department of Highways has not proposed extending the Spur route to U.S. 287 and the subject project in no way commits them to do so. The wilderness proposals for this area, now being considered by Congress and the responsible federal agencies, preclude such a proposal until the final boundaries are determined. This may be years away. Even if a road could be built without infringing on the wilderness, the U.S. Forest Service would take a very serious look at the environmental consequences of such a proposal. The Department of Highways and the Federal Highway Administration would also require

that extensive study be given to the environmental impact on the area.

The quote taken from the C.E.Q. guidelines, paragraph 5(b), has been taken out of context to say what ROMCOE wanted it to say. The remainder of the paragraph states "or when several government agencies individually make decisions about partial aspects of a major action. The lead agency should prepare an environmental statement if it is reasonable to anticipate a cumulatively significant impact on the environment from federal action. 'Lead agency' refers to the federal agency which has primary authority for committing the federal government to a course of action with significant environmental impact. As necessary, the Council on Environmental Quality will assist in resolving questions of lead agency determination." It has been the position of the Montana Department of Highways and the local Federal Highway Administration office that since the U.S. Forest Service prepared an environmental statement, and they are the local lead agency, an environmental statement for the road should not have been prepared because the Forest Service statement adequately covered the situation. Higher authority insisted that a statement be prepared and this has been done. This is still considered to be inconsistent with the lead agency concept and puts reviewing officials in an awkward position.

ROMCOE suggests that "-- there should be positive and irrevocable guarantees that any future extension to U.S. 287 will be located south of Lone Mountain."

This recommendation seems to be based on a biased or preconceived impression that the environmental impacts would be less south of Lone Mountain than they would be north of Lone Mountain.

Surely, a more scientific approach would be to carefully analyze all aspects of the situation before making such a firm commitment.

8. The Montana Department of Highways does not recommend change in the boundaries of the Spanish Peaks Primitive Area or the proposed Spanish Peaks Wilderness Area.
9. The changes in watershed and downstream water physiography have not been ignored. We agree that they can't be quantified at this time, however, we feel an improvement will result from the change in land use. Logging and livestock grazing of past years have been more degrading to water quality than the future recreational and summer homesite uses.
10. The earlier comments by ROMCOE on Big Sky and the U.S. Forest Service Environmental Statement are attached for the information of reviewing officials.

3Ea

Ltr #19

MONTANA HIGHWAY COMMISSION
RECEIVED
APR 17 1972
HELENA, MONTANA

Burlington Northern Inc.
Timber & Western Lands

6 N. Wallace Ave.
Bozeman, Montana 59715
April 14, 1972

Mr. H.J. Anderson
Director of Highways
Montana Highway Commission
Helena, Montana 59601

Re: Project F-20(1)
U.S. 191 Spur

Attn: Mr. G.O. Powers
Mr. K.F. Skoog

Gentlemen:

On April 12, 1972 I spent most of the day walking over the various alternate locations described in your Draft Environmental Statement on Project F-20(1), U.S. 191 Spur.

At the evening public meeting, I briefly described an alternate which is a compromise between alternates B and C, and I would like to take this opportunity to elaborate on why I feel this compromise alternate is worthy of consideration.

First allow me to express my feelings on the various identified alternates A, B, and C.

Alternate A:

As I see it, this alternate would be acceptable except for the reported unstable soils near the beginning of the alternate. If there are some real problems in this area, they should be avoided if at all possible. Also, since this road is to be heavily used during the winter period as well as the summer, I feel that a south aspect is advantageous to a north aspect.

Alternate B:

The major reason I don't like Alternate B is because it crosses the unnamed draw, requiring a large (45 foot) fill, then it swings to the northeast, crossing two more smaller draws, also requiring fairly large fills.

Alternate C:

This alternate has two bad points; the first is a large (45 foot) cut in the vicinity of station 205, and the second is the large (60 foot) fill required in the vicinity of station 218. Both of these would have a severe impact (visually) to

Mr. H.J. Anderson

April 14, 1972

the people who will be living in the closely adjacent residential areas. Also, if I am not mistaken, the 60 foot fill is right in the same area that Big Sky intends to use as an equestrian area. This proposal also approaches very close to the Lone Mountain Dude Ranch, depriving it of some of its privacy.

Compromise Alternate:

On the attached copy of your aerial photos, I have sketched the approximate location of a route which is flagged on the ground in orange ribbon at 7%; the location is shown colored red. Since this route is almost exactly the same length as the length of Alternate C it would replace, the grade will not change appreciably. The advantages to this proposal are:

1. does not require any clearing to speak of.
2. entirely on a southerly exposure.
3. avoids Big Sky's equestrian area.
4. avoids the Dude Ranch area.
5. skirts the proposed lake area.
6. requires only one small (20-25 foot) fill.
7. has acceptable alignment and grade.
8. nearly follows the Middle Fork Road (minimizing disturbance)
9. would have the least visual impact on the environment

The only disadvantage if this proposal is the fact that it would traverse a 60% sideslope, for about 400 feet on the east side of the unnamed draw, just about where the Middle Fork Road now goes. The soils (some shale) appear to be stable and since later portions of the road will be traversing equally steep slopes, this short segment should not present any particular problem, considering the standard of the road and your professional expertise. Beyond this point, Alternate C, in my opinion is the obvious and best alternate. The only other portion of the proposed Alternate C which I feel is critical is the proximity to the slide area. I had some difficulty finding the stakes in this area due to the snow, but I am well satisfied that your revised location does completely avoid this problem area.

In the event you choose to give these comments some consideration, and would like to look at this location in the field, I will be very willing to go along. I have attached my business card for your convenience.

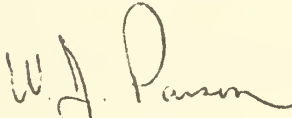
Mr. H.J. Anderson

April 14, 1972

I have no other specific comments relative to your Draft Environmental Statement, and feel that, although brief, the statement was well put together and spoke to the issues frankly and honestly.

Thank you for this opportunity to be a part of your decision making process.

Respectfully,



W.J. Parson
Resident Forester

copies: Mr. J.P. Duke-B.N.I.
Mr. Guss Raaum- Big Sky
Mr. Ken Galick- Gallatin N.F.

Date Recd. Processed		4-12-72	
No.	Item	Initials	Check
	MAIL ROUTE		
	50 GGP RMH		
	30 Field Design		
	30 Surface Design		
	31 C&G Design		
	32 West Region		
	33 East Region		
	34 Hydraulic		
	35 Design		
	36 Design		
	37 Design		
	38 Design		
	39 Design		
	40 Design		
	41 Design		
	42 Design		
	43 Design		
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	46 Design		
	47 Design		
	48 Design		
	49 Design		
	50 Design		

General: The alignment proposed in this Final Environmental Statement is a combination of Alternates B and C and is similar to that discussed by Mr. Parson of Burlington Northern Inc.



Ltr #20

Box 268, Route 2
Bozeman, MT 59715

March 28, 1972

Mr. H. J. Anderson
Administrator
Montana Highway Department

Dear Mr. Anderson:

I wish to have the enclosed letter to Senator Lee Metcalf, dated March 24, 1972, submitted as my comments on the draft environmental statement for Project F₂₀(1), U.S. 191 Spur.

The environmental statement was prepared by your office and is being circulated for public comment.

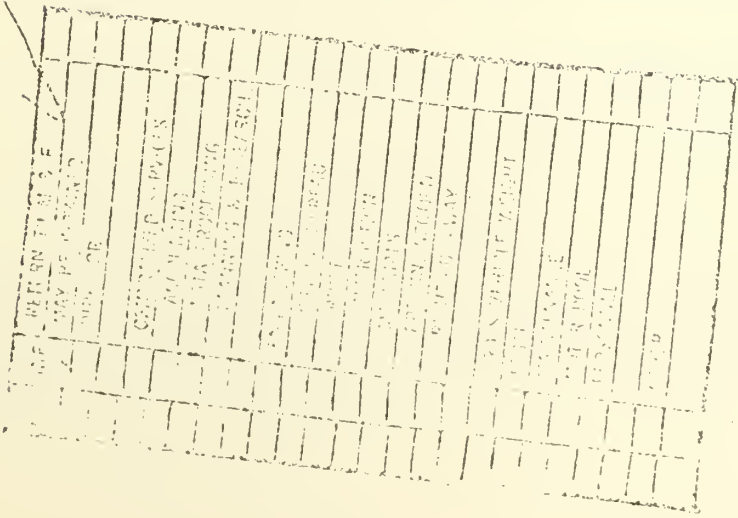
Sincerely,

Dorothy Bradley

Dorothy Bradley
Montana House of Representatives

Enclosure:

Letter to Senator Lee
Metcalf, dated March 24,
1972



Box 268, Rt. 2
Bozeman, Montana 59715

March 25, 1972

Honorable Lee Metcalf
Senate Office Building
Washington, D.C.

Dear Senator Metcalf:

I corresponded with you last summer about a boundary modification of your Spanish Peaks wilderness bill proposed by Mr. Lewis Chittin, past Montana Highway Engineer, because of a possible future highway location which would be eliminated by wilderness classification.

The Montana Department of Highways has drafted an environmental report (impact statement) for project F-20(1), U.S. 191 Spur, dated 2/16/72, for a proposed improvement for funding under Title 23, U.S.C., and is submitting it pursuant to Section 102(2)(C) - Public Law 91 - 190. The project, according to the description in the statement of page 1,

. . . begins on U.S. 191 near the mouth of the West Fork of the West Gallatin River. . . . It extends up the West Fork drainage a distance of 9.71 miles, to a point near the base of Lone Mountain and very near the divide between the Gallatin and Madison Rivers. The project is a federal-aid primary spur to federal-aid Primary Route 50.

I find the environmental report opinionated, skimpy on ecological facts, and sarcastic about what its authors refer to as "the do-nothing alternative." More seriously, I find it in conflict with other material, and incomplete in that the whole contemplated road project has not been included. I wish to discuss each of these complaints:

1. The second annual report of the Council on Environmental Quality, 1971, (Guidelines, see enclosure), makes it clear that contemplated activity must be included in impact statements.

It is certainly no secret that an extension of the road across the mountain range is a possibility some time in the future. Page 24 of the environmental report states,

. There is a possibility that this highway may eventually be extended into the Madison Valley and connect with highway 287 near Funnis. Although an extension of the route has not been submitted to the Federal Highway Administration, considerable public sentiment has been expressed supporting this possibility.

(I might add, there has also been considerable public sentiment opposing this possibility. This is a typical example of the non-neutral position expressed throughout the report.)

I am convinced that according to the guidelines the whole project should indeed be considered in the impact statement; not just the section proposed for immediate construction. If this is not accomplished, the door is open for a legal interpretation based on failure to consider the entire corridor.

Also, page 3 of Instructional Memorandum 50-6-71 (FP 10) (prepared for section 127 of the Federal-Aid Highway Act, 1970), states,

Where construction is on new location, or extensive relocation of an existing highway is involved, the studies will consider the entire corridor within which the project is to be located.

It is interesting to note that the Montana Highway Commission based the West Fork growth area application (entitled "Lone Mountain Access Road," dated June, 1971) on the premise that growth area designation would aid Madison County. The application states,

By providing needed highway facility, this project will improve the mobility of the labor force in a sparsely populated rural area -- and particularly so if the road is extended in the future to connect with the highway serving the Madison valley.

2. I mentioned the problem of conflicting information.

a. The economic growth center proposal states that the

. . . West Fork drainage of the West Gallatin River is hereby selected as an economic growth center, and the highway to serve this center is assigned first priority as a highway demonstration project.

The third paragraph of this proposal states,

The high priority assigned to this project results from the simple fact that if the needed transportation facility is not provided, then private capital committed to the area will be withdrawn.

On the other hand, page 32 of the environmental report states,

It is relatively certain that Big Sky will proceed with their development, and a roadway is required to transport people to the upper area. Should they be forced to use the

existing roadway, or some less expensive modification of the existing roadway, the result would be heavy volume of traffic on a low-class roadway with poor drainage, very little surfacing, steep slopes and little or no ditch.

No mention is made of pulling out private capital.

b. I find another conflict on page 2 of the environmental report. A sentence reads,

The change in land use is underway at the present time and is not being caused by the proposed highway construction.

Mr. Chittim's letter to you specifically asks for a southern boundary change of the Spanish Peaks primitive area because of a possible road. This involves changes of land designation and land use. In my opinion the change would certainly be "caused by the proposed highway construction," although it concerns the part of the road which was summarily excluded from the report!

3. Less important complaints deal with the project-serving bias of the report.

a. Page 33 states,

. . . the change in land use from ranching and timber harvesting to primarily recreational use will be desirable for future generations.

On what factual ground is that statement made? Should such a land use change be encouraged? And to what financial class of people do second homes, expensive skiing, and golfing appeal?

b. Page 20 of the environmental report states,

. . . a significant growth is foreseen in winter recreation. This will provide a better balance in the economy of the area.

Many studies point to the contrary, i.e., Squaw Valley, Maine, Colorado, et. al. Certainly the common factor of low paying, seasonal employment is a problem particularly relevant to Montana.

c. Page 2 states,

. . . the economic impact of this development will be felt by a large area of southwestern Montana. Gallatin and Madison Counties will share in a substantially larger tax base. Restaurants, gas stations, hotels and motels, airlines and other tourist oriented business will benefit. Employment at Big Sky will provide approximately 300 jobs.

I am wondering who will pay the costs of the new airport, the roads, the sewage and garbage disposal, the education for the children of 300 employees, and all the other services. Why is no mention made of the costs of economic development as well as the benefits? In the Lone Mountain case, as elsewhere, associated costs may far exceed the benefits. Is this not the reason for having impact statements analyze the socio-economic effects?

I hope you will agree that there are some complications with this project, and I would appreciate any help you can give.

Sincerely,

Dorothy

Dorothy Bradley
Montana House of Representatives

cc: Albert Melcher, ROMCOE
H.J. Anderson, Montana Highway Department
Francis Turner, Federal Highway Administrator
Fletcher Newby, Montana Environmental Quality Council
Clifton Merritt, Wilderness Society
Cecil Garland, Montana Wilderness Association
Gay Easton, Montana Wildlife Federation

General: We do not agree with Miss Bradley's contention that the Draft Environmental Statement is opinionated, skimpy and sarcastic. Every effort has been made to present all the facts about the project and to point out both the desirable and undesirable features associated with it.

1. The final statement has been rewritten to indicate there is opposition as well as support for extension of the Spur to connect with U.S. 287.

The Montana Highway Commission has not proposed extending the Spur and the presently proposed project in no way commits the Commission to make such a proposal. There are a number of plans that would designate the Spanish Peaks as a wilderness area. No decision has been reached on this designation or on the exact boundaries of the wilderness area, should it become a reality. No proposal for a spur extension can be made until the status of the wilderness area is determined. Even if the wilderness question was resolved, an Environmental Impact Statement would be required to evaluate the impact of such a proposal.

- 2a. It is not possible to predict what Big Sky would do if the road is not constructed. It is still considered possible they would abandon the development. However, in the period of time between when the growth center application was drafted and the present, Big Sky has become much more

committed through their construction program and sale of lots and condominiums. It is now considered highly unlikely that they would withdraw and, therefore, the environmental statement does not present this possibility.

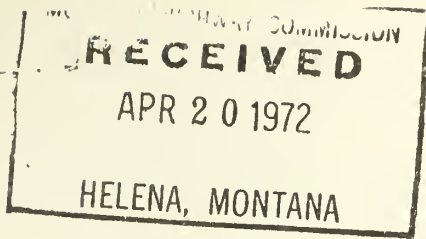
- 2b. The Montana Department of Highways does not propose any change to the boundaries of the Spanish Peaks Primitive Area or the proposed Spanish Peaks Wilderness Area. We have tried to keep both the U.S. Forest Service and the Montana Congressional Delegation advised with regard to how our planning might affect this area and how the proposed wilderness area might affect any future highway planning.

This is the logical thing to do where actions of one agency may affect another agency.

- 3a. It is one of the conclusions of the report that the change in land use will be desirable for future generations. If this conclusion is not valid, then the change in land use should not be encouraged. It is not expected that everyone will agree with this conclusion. However, this seems to be the opinion of the state and federal agencies involved based on the replies received on the Draft Environmental Statement.
- 3b. Montana enjoys a substantial tourist industry in the summer months and by expanding this to a year-round industry, it is anticipated that the total economy of the state will benefit. It is conceded that jobs in

this industry are low paying, but it is more desirable to have a low paying job for 12 months a year than a low paying job for 3 months out of a year. This is not the only industry with low wage rates and it is a clean industry that will create a minimum of environmental degradation.

- 3c. It is not anticipated that the proposed project will cause any change from the traditional methods of financing airport and road construction, sewage and garbage disposal and education.



Ltr #21

April 9, 1972

Comments on DRAFT ENVIRONMENTAL STATEMENT FOR U.S. 191 SPUR

by Cliff Montagne

See Exhibit B, p 35

The Alternatives A, B and C pass above a landslide near Station 200. This is the activated portion of a larger slide, the lower portion of which I have outlined in red on Exhibit B. The slide is mantled with glacial till, but its hummocky topography and frequent perched ponds indicate its unstable nature. Alternatives A, B and C pass through the slide above the small portion activated by the present logging road.

With frequent ponds in the lumpy slide topography, this landslide may be unique and important for wildlife habitat, including moose, which have been observed around the wet areas.

See exhibit B, p 36

Here, the present and proposed roads pass through landslide areas, two of which are recently active. Near Station 340 the roads go through an inactive slide area and are immediately (300 feet) below a small slide which ran in 1970.

In 1971, near Station 370, the logging road was cut by a slump block which downdropped that portion of the road an estimated two feet. The tension cracks and movement scarps were quite evident to road travelers.

Around the corner from this slump a possible weathered sill has been noticed in the present road cut. About one mile north of this location is a weathered sill on a steep slope across which a logging road has been cut. The slope is currently in a slide condition as a result.

From core drilling, the Montana Highway Dept. may have determined that most of the above mentioned unstable areas are suitable for highway construction with special engineering and additional cost. However, I doubt that the recent slump near Station 370 is known about. It would seem to be a hazardous place to construct a highway.

Cliff Montagne holds a Masters Degree in Geology. He spent the summer of 1970 doing field work in the West Fork Basin. This work is summarized in his thesis, Quaternary and Environmental Geology of Part of the West Fork Basin, Gallatin County, Montana. The work was done as a part of the National Science Foundation study, Impact of a Large Recreation Area On a Semiprimitive Environment.

Cliff Montagne
Box 265 Rt 2
Bozeman, Montana

Response to Letter

General: The geological features pointed out by Mr. Montagne have been recognized and investigated by Montana Department of Highways' geologists and the information compiled will be used in the design of the project. Various special design features are anticipated in some areas. These may consist of special slope design, sub-excavation, drainage and adjustment in alignment and grade as required for each individual situation. Although special consideration must be given to certain geological features, there are no areas which are unsuitable for roadway construction.

APPENDIX B

PUBLIC HEARING TRANSCRIPT
and
RESPONSE TO ENVIRONMENTAL COMMENTS

The transcript is included in its entirety. Following the transcript is a section giving responses to environmental issues raised at the hearing. For ease of reference, the responses follow the order of testimony in the transcript.

TRANSCRIPT OF A CORRIDOR PUBLIC HEARING
RELATING TO THE ROUTE LOCATION OF U.S. HIGHWAY
NO. 191 - SPUR FROM U.S. HIGHWAY NO. 191 TO THE LONE MOUNTAIN AREA

PROJECT: F 20 (1).

... ..

HELD IN THE DANCE HALL AT KARST CAMP
GALLATIN CANYON, MONTANA
WEDNESDAY, APRIL 12, 1972 AT 7:30 P M.

Transcript prepared by:

Preconstruction Division
Department of Highways
May 12, 1972

NOTICE OF A CORRIDOR PUBLIC HEARING

NOTICE IS HEREBY GIVEN THAT, in accordance with Section 116 of the FEDERAL AID HIGHWAY ACT OF 1956 and Policy and Procedure Memorandum 20-8 issued January 14, 1969 by the U.S. Department of Transportation, a Corridor Public Hearing will be held in the dance hall at Karst Camp approximately 35 miles south of Bozeman, Montana along U.S. Highway No. 191 on Wednesday, April 12, 1972 at the hour of 7:30 p.m., relating to the route location of U.S. Highway No. 191 - Spur, from a point near the Lower Village Area of Big Sky, Inc. development and extends west-erly approximately 6.7 miles to near the base of Lone Mountain. There will be five alternate alignments presented for discussion for the location of a new two-lane roadway, with a paved surface and drainage structures as required.


A copy of the Draft Environmental Statement report on environmental considerations, along with maps, drawings and other pertinent information relating to this project will be available for public inspection and copying at the Department of Highways office in Bozeman, Montana. The tentative schedule for right of way acquisition and construction, as well as relocation assistance programs will be discussed.

Engineers and other personnel, along with maps, drawings, displays and other data will be available for public review and questioning at the dance hall at Karst Camp from 2:00 p.m. to 5:00 p.m. on Wednesday, April 12, 1972.

INVITATION IS HEREBY EXTENDED TO ALL INTERESTED PERSONS in the subject matter of this notice to attend said hearing and to submit written briefs or verbal arguments either for or against the proposition. Written statements will also be accepted for ten (10) days following the hearing by the Department of Highways, Helena, Montana.

Dated this 6th day of March 1972

Project: F 20 (1)


H. J. ANDERSON

Director of Highways

A BRIEF ON OUR PURPOSES HERE TONIGHT

PROJECT: F 20 (1) U.S. 191 SPUR

April 12, 1972

Good evening, ladies and gentlemen. On behalf of the State of Montana Department of Highways, I welcome you to the formal part of the public hearing this evening. We are here this evening to present to the public several alternate locations for a new highway connecting the Upper and Lower Village areas of the Big Sky, Inc. with U.S. Highway No. 191. This project, having been approved by your Montana Highway Commission and the Federal Highway Administration, will be included in the Federal Aid System as a primary highway spur connection of U.S. No. 191, being designated as such to serve an area that meets the criteria of an Economic Growth Center. This qualifies it for increased federal participation, as compared to other standard primary highway projects throughout the state. This participation will be approximately 86% federal funds and 14% state monies.

The program for the hearing tonight will be to discuss the pros and cons of the alternates as shown on the display. We shall focus our comments and attention to this proposal here tonight.

If anyone does not wish to express their opinion verbally on the microphones, or has further thoughts after the meeting, we will gladly accept any written statements tonight and for the next ten days. If you would mail in any statements, address them to the Department of Highways, Helena, Montana. All statements received within the next ten days will be attached to the transcript that will be made of the proceedings here tonight.

Since the purpose of this meeting is to discuss the routing of a new highway project, time for questions unrelated to this subject may be limited. Questions of this type will be accepted and referred to responsible personnel for an answer, if not at this meeting, perhaps in writing at a later date. We would appreciate everyone refraining from entering into any long repetitive debates so that we can use our time effectively to discuss the highway location project for everyone involved. Those of you who do not wish to speak but have a question, write it down and we will do everything possible to get you an answer, as we will any other questions asked.

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The following is a transcript of a Corridor Public Hearing held in the dance hall at Karst Camp approximately 35 miles south of Bozeman, Montana along U.S. Highway No. 191 on Wednesday, April 12, 1972 at the hour of 7:30 p.m., relating to the route location of U.S. Highway No. 191 - Spur, from a point near the Lower Village area of Big Sky, Inc. development and extends westerly approximately 6.7 miles to near the base of Lone Mountain. There were five alternate alignments presented for discussion for the location of a new two-lane roadway, with a paved surface and drainage structures as required.

The hearing was attended by the following Department of Highways personnel:

Jack R. Beckert, Administrator-Engineering Division, Helena
Dennis A. Williams, Supervisor-Division Construction Section, Bozeman
James V. Keyes, Manager-Field Right of Way Unit, Butte
Steve Kologi, Manager-West Region Unit, Helena
Ken Skoog, Area Engineer, Helena
Bob Samson, Special Assignments Engineer, Helena
Don D. Anderson, Manager-Public Hearing Unit, Helena

Representing the Federal Highway Administration were:

Harold N. Stewart, Division Engineer, Helena
Harold J. Ollila, Area Engineer, Helena
William S. Dunbar, District Engineer, Helena

T R A N S C R I P T

ANDERSON: Good evening, ladies and gentlemen. Can everyone hear over there in the bar area? We're kind of crowded in here tonight. On behalf of your State of Montana Department of Highways, I welcome you to the formal part of this public hearing this evening. We are here tonight to present to the public the routing of a new primary highway that would connect U.S. 191 with the Lone Mountain area. We will shortly have a more detailed presentation from one of our engineers and we will also have a right of way presentation, after which we will open it up for questions and answers from the audience. First of all, I would like to introduce a few of the highway personnel that we have with us this evening. We have Mr. Jack Beckert, Administrator of the Engineering Division, from Helena; Mr. Dennis Williams, Supervisor-Division Construction Section, from Bozeman; Mr. Jim Keyes, Manager-Field Right of Way Unit, from Butte; Mr. Steve Kologi, Manager-West Region Unit, from Helena; Mr. Ken Skoog, Area Engineer, from Helena and I am Don Anderson of the Preconstruction Division, also from Helena. This being a Federal Aid Project, the Federal Highway Administration does work very closely with your Department of Highways on the

planning, financing and development of all projects on the Federal Aid System. Representing the Federal Highway Administration this evening is Mr. Harold Stewart, Division Engineer, from Helena; Mr. Bill Dunbar, District Engineer, from Helena and Mr. H. J. Ollila, Area Engineer, from Helena. We will now begin with the presentations. Would you please hold all questions until we have finished our presentations and then we will open it up for discussion. At this time I will turn it over to Mr. Ken Skoog and he will give us our presentation. Ken

SK00G:

Thank you, Don. As Don said, the project that we're here to discuss tonight is a portion of Federal Aid Primary Route 50 and a spur connection of that route. The route begins at 191 near the mouth of the West Fork of the West Gallatin, extends about 9.7 miles westerly to the vicinity of the base of Lone Mountain near the divide between the Gallatin and the Madison Rivers. The first three miles of this route, which are shown partially here and partially off the end of this photo, are presently under construction; a contract that was let last summer. This is a grading contract and a bridge structure across the West Fork of the West Gallatin. The project that we will discuss mainly tonight is a project which begins at the end of this existing construction and extends for 6.7 miles to the vicinity of where Big Sky of Montana, Inc. plans to build their Mountain Village. The new roadway will provide a 34-foot finished roadway width. This will be a paved top, will have two 12-foot driving lanes and two 5-foot shoulders; have six-to-one safety inslopes and a minimum of a 15-foot ditch. Cut and fill slopes will vary in accordance with the material involved and the height of the cut or fill. Design standards for this project, being a primary route, are in accordance with the Department of Highways' standards for primary highways. These standards will be compatible as nearly as possible with the physical limitations of building a primary highway in a mountainous terrain. We will attempt to limit the grades on the road to 7% and a maximum degree of curvature of 12 degrees and 30 minutes. Lesser standards may be used in specific instances where the terrain might dictate. We have a design year, which is a 20-year future traffic, of about 1400 vehicles per day. The design standards for this section that is presently under contract - although it was not let as a primary project - the standards for this section are comparable to what we are proposing for the upper 6.7 miles. The standards are basically a combination that will provide a safe highway for the traveling public, and also be compatible with the mountain terrain being traversed. I'll give a short description of the route of the project. It begins near the upper end of the area that Big Sky is planning to develop their Meadow Village in. Their Meadow Village - you can see it partially under construction in this area. Some of these areas in here are part of the golf course. There's some condominiums under construction in the lower part down here. The project would begin here, traverse up, cross the Middle Fork of the West Fork. There are five alternate lines being considered in this section, from about where we might

cross the Middle Fork to a point up about two miles. Let me discuss the entire route and then come back and discuss individually these alternates. The route continues on up, crosses the Gallatin-Madison County line, follows up - pretty much following the existing logging road that is built into the Middle Fork and ends in the vicinity of the Upper Village. This is about a mile east of Ulerys Lakes and very near the divide. I think the divide would set just about at the edge of this photo or a little bit past it. Lone Mountain would set off in this direction to the southwest. You can see the Middle Fork running through this area. Let me come back now and describe a little bit the five alternates. Alternate A will take off near the start of the project and proceed up the south side of the Middle Fork for a distance of about a mile, cross the Middle Fork, climb up a draw in through here, up - if you're familiar with the area, there's an old saw mill that sits right about in here - traverses on farther up and to the end of the alternate study. One of the primary reasons for conducting this alternate study was the existence of a landslide and an unstable condition in this area right here. There is an existing slide in the logging road that is in there right now. Alternate B follows up the north side of the Middle Fork, crosses the unnamed draw, makes a switchback around and back and on up. Alternate C comes . . . I believe they call this the North Fork of the West Fork . . . follows a little bit farther up the North Fork, stays higher on this slope, up and again above that slide area and ties back in. Alternates D and E attempt to stay on the other hillside away from that slide area and traverse up. Some of the items that were considered in trying to come up with a location in this area to avoid this slide area . . . and we have had geologists take a look at this slide area; they say it's not impossible to go across it but it would be quite expensive . . . and so we have tried to find routes that will not cross this slide area. Some of the items considered in trying to determine the location: First, we have tried as much as possible to follow the existing roads for the entire location; follow the existing scars that are already in the area. We have tried to maintain grades that will provide safe and reasonable travel in wintertime when there will be heavy traffic on this route, striving for a maximum grade of about 7% horizontal curvature to try to keep our curves as gentle as possible but yet not to cause too much damage to the landscape. Another thing that's important is the exposure. To be on a north slope will give you a better exposure in the winter and better winter maintenance. On these alternates, some of the advantages and disadvantages: Alternate A crosses an old slide area in this reach in through here; this first mile. This area is stable at present but would probably require special design features in the design if we were to cross that area. Possibly such things as perforated drains, flat slopes and such, to avoid activating any slide in this area. Alternate B has a 7% grade through this area; a little flat spot and 7% up to climb to a point above this slide. It has fairly sharp curvature in this "S" curve right in here. Alternate C will involve a fairly large

fill across the North Fork. It runs pretty much a constant 7% grade in order to attain this elevation up here. Alternates D and E: Alternate D has very good alignment; however, the grades involved are in the range of 9% to 10%. There's also quite a large fill in this draw right here, a fill in the range of 100 feet. Alternate E was an attempt to both reduce this fill height here and to lessen the grade. We did accomplish a major reduction in fill height; however, the grades remain between 8% and 9%. I think that about covers what I have, Don.

ANDERSON: Thank you, Mr. Skoog. I would at this time, then, like to call on Mr. Jim Keyes to give us a right of way presentation. Jim.

KEYES: Thank you, Don. I'm Jim Keyes, Manager of the Field District Right of Way Department operating out of Butte. Butte happens - for right of way purposes - Butte happens to have jurisdiction over this area. From my knowledge of the proposed project, our right of way problems will be quite minimal. However, I'm going to take this opportunity, and very happy to because there's such a large crowd here, to explain to you the service that the Department of Highways has to offer with regards to people that may be displaced or affected by right of way acquisition, not only on this project, if there be any, but anywhere in the state. I'm sure that you folks from time to time have been touched with right of way problems and I want to explain to you that in recent months the Department of Highways has operated a relocation service, which means that we offer assistance to people that are affected by the acquisition of right of way: your home, your business, your property or your tenants, your lessees, your contract purchasers, or whoever they might be. If we have caused you to have to relocate, we have a service in Butte, as well as elsewhere in the State of Montana in the other districts, that we will aid and assist you in finding a new location. We will aid and assist you in moving your personal property, and if we are in a position, or you are in a position whereby your business has to be replaced or relocated, we also have assistance in that, over and above the appraisal on your property and the fair compensation offered you by the appraisal section. This service is open to you regardless of race, color or creed, and it comes automatically to you before you have to leave your property. Now, again I say, with the exception of the very start of this project, I don't believe that the right of way problem will be great but we are required to announce this service and to remind you that it is available wherever you might live in the State of Montana, and whenever you might be affected in the State of Montana. That is about all I have to say now.

ANDERSON: Thank you, Jim. Now, before we get into the audience participation, I would like to mention that we will accept any written statements you have with you tonight if you have them available. If you don't want to read them into the transcript at this time, or wish not to, we will accept them now and these will be attached

to the transcript that we make of these proceedings here tonight and will be reviewed along with all the testimony. We are transcribing everything that is being said here this evening and for this reason, we ask that anyone having a question, would you please try to get to one of the microphones. We will try to have somebody available to pass them around to you, to those of you sitting in the back and also in the bar area. If you would come up to the microphone and give us your name and who you represent, we will try to get as many questions in as possible. Was there someone who would like to start out on this question and answer? There's a microphone right there if you would grab that, please.

GOETZ: I would like to ask a question about procedures. I also have a statement to read into the record. My name is James Goetz. I'm a citizen of Bozeman, a native of Ennis, I live in Bridger Canyon and I drive on gravel roads to and from work every day. Specifically, the question I've got to ask is, a brief on our purposes here tonight, put out by the Highway Department, indicates that we will be here talking about the pros and cons of the alternates as shown on the display. "We shall focus our comments and attention to this proposal here tonight." Later it says "Since the purpose of this meeting is to discuss the routing of a new highway project, time for questions unrelated to this subject may be limited." Now, it is my understanding that this is a Corridor Hearing, as required by Policy and Procedure Memorandum 90-1 of the federal regulations. If I'm incorrect in that understanding, please correct me. It is my understanding that this hearing therefore requires that we discuss, in addition to alternatives to corridor locations, the quote "Need For" the highway, and if that is the case, can we raise questions which you apparently feel here to be irrelevant, and that is economics, sociological questions, environmental questions concerning the need for the highway, and procedurally, I think this question should be cleared up before we proceed?

SKOOG: Yes, we definitely want to answer questions in regards to ecological questions; socioeconomic. We would like to try to limit the discussion to discussion pertaining to the road project rather than items unrelated to the road project.

GOETZ: Well, I intend to keep my comments related to the road project but I do question, specifically, rather than an alternate route location, the "Need For" which I assume from your answer is relevant and I have a statement to give for the record but I'll capsule it verbally for everyone's benefit here. My first paragraph reads "It is my position that the use of substantial sums of public money to build an access road for a private speculative land development is bad policy. It is my further belief that many of the acts of the Montana Highway Commission and the Federal Highway Administration, in their attempts to finance the road between Route 191 and Lone Mountain, are inconsistent with federal law" and then my statement delves pretty specifically with legal issues, which I'll capsule as follows. That is, the Federal

Environmental Policy Act of 1969 requires any federal agency that plans a project with major significant effect on the environment to prepare an Environmental Impact Statement based on a number of considerations. In this case, there's been no Federal Environmental Impact Statement prepared. In lieu of the federal statement, there's been a state impact statement prepared by the Montana Highway Commission. I deem this to be - or I presume this is pursuant to the federal regulations which authorize an applicant, that is, the Montana Highway Commission, to prepare this impact statement. It is my position here that the delegation of authority is illegal and inconsistent with the National Environmental Policy Act and, in fact, there have been a number of federal court decisions which have ruled that the function of preparing an environmental impact statement is a nondelegable function. In other words, the federal agency has to prepare the statement and the statement has to accompany the proposal through all stages of administrative review. Specifically, my conclusion here is that this is a stage of administrative review, there has been no federal impact statement, so I request, formally, that this hearing be postponed until we can have a federal impact statement prepared independently by the Federal Highway Administration.

SKOOG: With regard to the environmental statement, the environmental statement that has been prepared has been prepared by the Montana Department of Highways for the Federal Highway Administration in accordance with their rules and regulations with regard to Federal Aid financed projects. I am also aware of some of these court decisions and - I'm not sure - I think some of them are fairly recent. I'm not sure if this will be a universal interpretation. If you are right, maybe our environmental statement does not satisfy the law. However, the environmental statement that was prepared does satisfy the procedures under which we operate and I think we should proceed with the hearing.

ANDERSON: Yes, sir. You have a question, there with your hand up? Use that microphone in front of you, please.

ANACKER: My name is Ed Anacker and I'm from Bozeman. I'd like to ask a question and then I would like to make several very short statements. The question is, has the decision already been made that the road will be funded from federal - or in part - from federal sources?

SKOOG: If the highway is constructed, it will be constructed from Federal Highway Primary Funds, yes.

ANACKER: All right. Then I would like to go on record as opposing federal funding. That is, I would go on record as opposing the paving of this highway from federal funds and I would like to use your own statements, or the statements of the Montana Highway Department. On Page 13 I find the statement "Big Sky, Inc. is a land development corporation and as such will be marketing home sites and

condominiums. Their recreational development is designed to attract buyers who will use these facilities." I believe that if this is the case, then Big Sky ought to pay for the development of their own road. I would also say that to fund this road from federal funds will establish a bad precedent and one can expect that other land developers will also want to obtain federal funds. I would oppose the use of federal funds for another reason. If this becomes a federal highway, as soon as it is completed there will be pressure to continue the highway on to the Madison River and I would not like to see that for reasons that it will put more pressure on the Spanish Peaks area. Perhaps later I could amplify that but I would not like to take the time now.

ANDERSON: Thank you. The gentleman in the back with his hand up. Would you get that far microphone over there.

HAGLUND: I'm Brent Haglund of Gallatin Gateway. I am coordinator of the Ad Hoc Coalition of Concerned Organizations. The testimony I shall present has been approved by the Bozeman Group, Sierra Club; the Absaroka Beartooth Task Force; the Montana Wilderness Association; National Forest Preservation Group; The Wilderness Society; Gallatin Chapter, Zero Population Growth; Democratic Coalition and Environmental Task Force. This statement is the joint effort of a number of groups who have witnessed the erratic performance of federal agencies in implementing national environmental policy in the West Fork of the West Gallatin River over the past two years. The organizations submit this statement as part of their continuing effort to monitor administration action to help ensure that it does not contravene the policy so set forth in the National Environmental Policy Act of 1969, Public Law 91-190. That is "To declare a national policy which will encourage productive and enjoyable harmony between man and his environment; to promote efforts which will prevent or eliminate damage to the environment and biosphere and stimulate the health and welfare of man; to enlist the understanding of the ecological systems and national resources important to the nation." The Coalition appreciates the opportunity to comment and I will read our summary statement. Our comments follow. Number one: The Department of Transportation's decision to approve the West Fork of the Gallatin River drainage, an area completely within the boundaries of the National Forests, as an area to receive federal funds to promote growth and development of the selected surrounding areas is in direct conflict with the purposes for which the National Forests were established and subsequent Congressional acts defining management policy for the National Forests. The Coalition asks that the decision to approve the West Fork and surrounding lands as a growth center be reassessed by the Department of Transportation and the Forest Service and a new decision made, with proper consideration given to Public Laws pertaining to National Forest management. Two: The Coalition believes that the West Fork area is of minimal compliance with

the requirements of the Federal Highway Administration criteria in Instructional Memorandum PP-10. The type of development taking place in the area will not provide for many years the type of services listed by the Federal Highway Administration, nor does it appear that the majority of the users will make their permanent homes there. The Coalition asks for more documentation and studies before being satisfied that the area meets the Federal Highway Administration's criteria set forth in Memorandum PP-10. Consideration should be given by the Federal Highway Administration to the denial by the Economic Development Administration of funds for a similar highway project on the basis that the proposed beneficiary of this project, Big Sky, Inc., would not create enough jobs to accommodate either the underemployed or the retrainable unemployed within Madison County. The Secretary of Transportation's approval of the West Fork area as a federal primary spur route, dated August 20, 1971, and as an Economic Growth Center, November 2, 1971, do, in the opinion of the Coalition, require environmental statements as provided under Section 102(2)(c) of the National Environmental Policy Act. The Draft Environmental Statement for Project F 20 (1), U.S. 191 - Spur, as prepared by the Montana Department of Highways is, in general, a shallow, project-serving document, devoid of facts and thorough environmental analysis. The Coalition believes that the draft statement is further deficient for it considers only a 9.7 mile segment of a proposed highway from U.S. 191 to U.S. 287 near Ennis, Montana. An environmental statement must be completed on the entire proposed route before any decision or construction can be instituted on any segment of the corridor. Five: The selected Burlington Northern, Inc. lands in the Burlington Northern-Forest Service Land Exchanges Nos. 2 and 3, the Economic Growth Center, and the location of the proposed primary spur highway are all located in the same general area. Therefore, the environmental and socioeconomic impacts of these actions accumulate considerably. Because of the lack of agency coordination to date, the Coalition insists that a lead federal agency be assigned to assess the cumulative impacts of the combined federal actions taking place. Right of way acquisition for the portions of the primary spur through public lands to be traded to Burlington Northern should be obtained prior to the completion of the exchanges. A recent decision by the Second Circuit Court of Appeals interprets national environmental policy to require federal agencies to prepare their own detailed environmental statements and that to hold hearings prior to the preparation by its own staff's impact statement is in violation of the National Environmental Policy Act and, therefore, the Coalition concludes that the April 12, 1972 Corridor Public Hearing for F 20 (1), U.S. 191 - Spur is invalid, since it obviously is being held prior to the completion of the Department of Transportation's environmental impact statements required with approvals of the West Fork's area as (1) a primary spur, (2) as an Economic Growth Center, and (3) as a Federal Aid Highway Project. Thank you.

ANDERSON: Do you have a written statement you want to submit with that?

HAGLUND: Yes. When I said it was a summary, we have a thirteen page statement to be presented.

ANDERSON: Thank you. Yes, sir. Would you use the microphone.

REICHMUTH: My name is Don Reichmuth. I have certain talents in training that I believe is pertinent to this. I have a professional engineering degree . . or, I am a registered professional engineer and land surveyor and I also have advanced work in soil mechanics and rock mechanics, and I would like to direct my questions to some of the technical areas here that deal with the route itself. Now, before I start I want to ask one question. Is this a corridor hearing or a corridor hearing and a route hearing?

ANDERSON: A corridor hearing, discussing different routes through this corridor that we're speaking of that's already . . .

REICHMUTH: Will there be a design hearing at some later date?

ANDERSON: At such time as plans are completed far enough for a discussion of design details. If this is so approved, yes, a design hearing will be scheduled.

REICHMUTH: It will be the second hearing.

ANDERSON: Right.

REICHMUTH: The way that the law reads it's possible, under certain conditions, to combine the two, but there will be definitely another . . .

ANDERSON: At least another opportunity for a design hearing. More than likely we will have a design hearing, yes.

REICHMUTH: Will you have it or will you not have it?

ANDERSON: Yes.

REICHMUTH: I would like to . . . I dug out my old Webster's Dictionary and it defined two things. A corridor is a geopolitical . . and in geopolitical terms, is a narrow strip of land across territory previously foreign. Now, there's some question in here that we are discussing a corridor hearing. I would like to read two other definitions. One's a route, and it's a broken or beaten way - a course or a way - which is to be traveled. And then another definition for align; to adjust or to form a line. Now as we get along you'll see this. There is some question on whether this, in fact, is a corridor; this is a corridor or this is a corridor.

UNIDENTIFIED: Get closer to the mike! Speak up!

ANDERSON: That mike will come off of there. I'll raise it up a little bit.

REICHMUTH: My first question is, can you tell me precisely when these aerial photographs were taken; the date?

SKOOG: I can't tell you exactly, but they were last fall.

REICHMUTH: They were last fall; fall of 1971. Now, my next question, or statement, is that on Page 24 of your Environmental Impact Statement, you made mention of extending this road over to Ennis, which was covered previously. I'll not quote it, I think we all know, but I would also like to have some additional information on what work has been done on this - going from the end of which is called the Upper Village over to the highway at Ennis. For instance, has there been any aerial photos taken of this region?

SKOOG: Let me give a brief statement on this proposal or the possibilities of a route extending over to Ennis. The Montana Highway Commission has not to date proposed that this route be extended. There has been requests, there has been controversy, over whether it would be possible to extend the route into Ennis. The Highway Commission has gone as far as to agree to take a look at the feasibility of a route extending over to 287 and we have taken some aerial photos. We do plan to look at the photos, possibly even to do some mapping in this area to study the feasibility of this area. There are a number of other considerations; mainly, problems involving the boundaries to the Spanish Peaks Wilderness Area. There is presently a bill in front of Congress to establish boundaries for the Spanish Peaks Wilderness Area, which would preclude an extension off of the end of what you see on these photos here tonight and I think, until such time as the boundary of the wilderness area is resolved to the point where we would not be in conflict with the proposals to extend the wilderness area, then we cannot proceed any farther than just taking a cursory feasibility look at various routes that one might take down the other side.

REICHMUTH: In other words, you have taken photographs of possible routes over to Ennis?

SKOOG: Yes, we have.

REICHMUTH: Have you had people on the ground studying the route?

SKOOG: We had two people take a walk through the Jack Creek area at one time.

REICHMUTH: So there have been people on the ground.

SKOOG: Let me go a little farther with this. Even if the boundary of the wilderness area were settled, we have had some discussion with the people from the Forest Service and their statement is that they would have to take a very serious look at the environmental impact, as we would also; the environmental impact of an extension to this road before any route proposal was ever advanced.

REICHMUTH: Also, have you done any work in the Middle Fork or Beaver Creek, or any of the other areas lying south of this, as far as the general, overall concept of a road through here is concerned?

SKOOG: Beaver Creek and where?

REICHMUTH: Beaver Creek and Middle Fork; going up Middle Fork.

SKOOG: Well, you're going up the Middle Fork with the road here. There is something called the South Fork, I believe. No, we haven't looked at anything in those areas.

REICHMUTH: You have not done any work beyond this corridor here?

SKOOG: No, we have not.

REICHMUTH: All right. Now, I'd like to address one more question here so we can get some of these facts straight, to the fellow who is the right of way . . . in charge of right of way. Could you tell me how many landowners are on the proposed route that we see here? This section?

KEYES: Definitely, not the precise number. I am told that, say for except perhaps one landowner on the beginning of it there - of this new proposal - that there would be little or no right of way problems.

REICHMUTH: Who is the landowner in this area?

KEYES: I presume it would be the - and I can't tell this for sure, but the one landowner there on the start of it is the same landowner that was dealt with on the other section. I don't have the name and I am told that the balance of it is over federal or state lands, but not private individuals. Now, that is what I have been led to understand at the moment. I may be wrong in that.

SKOOG: Let me clarify that a little bit. I believe that the land - other than this one parcel that Mr. Keyes mentioned - will be either Burlington Northern, Big Sky, or U.S. Forest Service. If the land exchange is approved, there would be no Forest Service land involved.

REICHMUTH: My next question. Is it not in fact . . . Burlington Northern's a party or a stockholder in the Big Sky Corporation. In other words, my point is that, in fact, we have one landowner for the entire route.

SKOOG: This has been published in the papers, I believe, that B. N. is a stockholder in Big Sky.

REICHMUTH: Now, could the fellow who is in charge of right of way tell me the approximate cost of the right of way through this area?

What would you anticipate, and possibly you could use some of this other ground, the first part, as an example for us.

KEYES: Sir, I did not come here tonight to prepare to break down the right of way cost of this proposal. No, not tonight. That estimate could be presented . . .

REICHMUTH: Well, we're discussing economic matters and I believe it's pertinent to the discussion, isn't it, to get some idea of the possible cost of the right of way in this area?

KEYES: I'm not prepared to answer that question. I repeat, it can be furnished.

REICHMUTH: My next question is, how much public money has already been spent on surveying, engineering and construction on the proposed route? This would include the original portion, the first three miles, or 3.1 miles? Can someone give me that answer?

BECKERT: This is Jack Beckert. We have some of this information available tonight, but we don't have a total on that. After all, we are expending additional money to it practically every day.

REICHMUTH: Could you give me some estimate? Five hundred thousand dollars?

BECKERT: The first project, that is, the part that we are not talking about tonight - that is up to where the red line starts - took approximately a half a million dollars. Of this, two hundred and eighty-eight thousand was supplied by Big Sky.

REICHMUTH: So there's some two hundred and fifty thousand, or a quarter of a million dollars of state money, or public money, already spent on the route?

BECKERT: On that portion, yes.

REICHMUTH: All right. Now, you state on Page 11 that the Mountain Village, which I assume is the same as which you listed as your Upper Village here . . . is that correct?

ANDERSON: That's correct.

REICHMUTH: . . . that the site preparation began in the summer of 1971. Now, these photos you said were taken in the fall of 1971. I would like to have someone show me the development that this refers to on the photographs, and also show me what sections of land these are occurring in. You do not have section lines shown on your alignment, with the exception of the Gallatin-Madison County lines, which I believe is a defect of the material.

SKOOG: I believe the area that we meant, in saying that some work was done in the Upper Village area, is clearing of old slash debris

in that area.

REICHMUTH: Can you tell me where?

SKOOG: I'm not sure exactly where, no. I believe Big Sky did some work up there in some area. I'm not sure where.

REICHMUTH: Well, wouldn't it be very useful if this information could be documented? Now, I'd like to call your attention to this one area on the second photo where the splitting of the routes occur in large number here. Isn't there a fairly gross error here on your part? Last spring, or last summer when Big Sky presented their master plan and their detailed work there . . . This is a big lake and you have all these routes under water. Did you make a . . .

SKOOG: Big Sky has done some study of lake areas. They have scrapped most of them. None of these routes are under water.

REICHMUTH: Why did they scrap them?

SKOOG: There were some geological problems.

REICHMUTH: So, in other words, they changed their plans after they presented it to the county and the local officials because of some technical problem, is this correct?

SKOOG: I wouldn't want to testify for Big Sky.

REICHMUTH: But they in fact did drop them because of your route in the site of your location?

HOUSEMAN: No.

SKOOG: No.

REICHMUTH: This is it right here I believe. Anyhow, my point is that . . what assurance do you have on the . . what's called the Upper Village, that there, in fact, is not going to be a change of plans there. If, for instance, some technical problem like, oh, maybe the rock glacier on Lone Mountain or the persistant temperature inversions, or maybe the unstable shale area that we have here or maybe the fact that it's a very cold area and has a very low number of days where we have frost-free - something like thirty, I believe, in the area - what assurance do you have that this will not be scrapped like the dam, for instance, was scrapped?

SKOOG: That may require adjustments to what we have to present here tonight; minor adjustments. I believe that the . . . where the road ends in that upper area there is a reasonable approximation of where the route will go.

REICHMUTH: Well, if the route doesn't go somewhere, there's no sense in having

it. Now, if they're not going to build I see no sense to the road, is there?

SKOOG: I think you're right. Yes, there is no need for the road if they do not build.

REICHMUTH: Okay, let's just examine one of these geologic hazards, and I believe we can call on Mr. Dennis Williams who is sitting at the table. Mr. Williams has more talents than this. He was the state geologist on his previous job, I believe. Isn't that correct, Dennis, you also do geologic consulting work besides this so you are well qualified in this area?

WILLIAMS: Very seldom, Don. (Laughter)

REICHMUTH: But you have done geologic consulting? (Laughter)

WILLIAMS: Yes.

REICHMUTH: Now, I would like to . . . really, there's a couple little statements on this, your Page 15 in the geology section of this, "Landslide-prone formations occur in the area. The landscape is literally dominated by strong sloping areas of stabilized landslides" and this goes on for . . . many places in there where you refer to landslides. I think it was brought up previously many times. Now, you also make a statement there that these can be designed to take care of. Now it's a little bit unclear to me. Are you saying that you can design roads so no landslides will occur?

WILLIAMS: Don, the thing that is in there as a geology excerpt is taken from, I believe, the report published by the university that you represent . . .

REICHMUTH: I . . .

WILLIAMS: Oh, excuse me, you don't represent the university, that's right. (Laughter)

REICHMUTH: I represent myself and myself only, get that very clear!

WILLIAMS: All right, and now I will tell you that the staff of geologists from the Highway Department have investigated this area, that we have discovered certain unstable areas. Alternate . . . I can't see that too clearly. The most southerly alternate there traverses what we know to be several unstable areas. Alternate . . . that would be Alternate A. Alternate C is in its present location because it is in fact missing the geologic hazard that was present. Alternate B has been routed so that it also misses the geologic hazard that was present. The fills have been investigated and are being investigated. We have to go back next summer and investigate an area right at the beginning of the line

to design the cut slope in the first cut. The remainder of this has been investigated.

REICHMUTH: The point is though - regardless of who does the work, it's very possible to get a failure. There's no way at this point in time to guarantee that no failures will occur. Is this not correct?

WILLIAMS: I think that this could be said about any highway or anything that man ever built. (Applause)

REICHMUTH: Now, my point is that you've stuck to one corridor, or one valley, to get the highway . . . to effectively the other side if we're going to serve Ennis. Now, my point is that why, if we're going to have a corridor study tonight, why don't we - and why didn't you - study possibly the Beaver Creek, or possibly the other fork starting off - I guess it's the South Fork - why weren't some of those other areas studied to see if in fact we could not get this route over the area without going through these cretaceous shelves which have severe problems?

BECKERT: This is Jack Beckert. The Highway Department is working on a Federal Aid Project. The Federal Aid Project consists of practically the total mileage on the Federal Aid Route. The Federal Aid Route starts down here at the Soldiers' Chapel and ends up there at the Upper Village, or Mountain Village, if you care to call it that. As such, our project has to be limited to the route. The Highway Commission has not taken any action to extend the route over the hill to Ennis and, therefore, there is no point in us, at this time, making a detailed study of any possible extension of a route that may never come to pass.

REICHMUTH: But this is a corridor hearing, sir. This is not a route hearing, this is a corridor hearing.

BECKERT: Corridor from the Soldiers' Chapel up to the Upper Village.

REICHMUTH: In other words, the corridor has been established?

BECKERT: Yes, up to the Upper Village.

REICHMUTH: So the fact that this is a corridor hearing is . . . really is, after the fact so there's really nothing more that I can say if you, in fact, have established this as the corridor here that you're going to use.

BECKERT: There is one other point I would like to make and that is, you were discussing cost. Now, you were inferring that we should have made a more extensive investigation of all these lines and, of course, this is not a design public hearing. We have gone on record that we intend to have a later design public hearing. At that time we will have much more detailed information as to the line. After all, in the interest of economy you cannot

make all investigations into all possible alternates in complete detail. It surely would not be prudent to turn out five or six total designs at a time like this. We are merely trying to get a location and then we would perfect that particular design, in the interest of economy.

ANDERSON: Thank you gentlemen. Someone else? Yes, back there.

CUMMINGS: My name is Steve Cummings. I am a resident of Montana and now living in Bozeman. I'm speaking as one of the members representing one of the groups contained in the Coalition, which Brent Haglund described before; Zero Population Growth, Gallatin Chapter. I'm going to address myself tonight to one of the primary decisions that has brought everybody here together. That decision was the designation of this whole area, about, oh, a thirty-five section area, as an Economic Growth Center and it is our contention that the decision to designate this area as an Economic Growth Center was, in the first place, contrary to policy. We have two groups working at cross-purposes, and in the second place, made without the consultation of all the appropriate federal agencies, and particularly the Forest Service. The Coalition is concerned about the precedent of setting . . . declaring large areas within the boundaries of the national forest as potential areas of economic growth and development. As you know, this whole area is within the national forest, Gallatin National Forest. It is the Coalition's contention that such designation and the use of funds to promote the growth and development of the selected land and surrounding areas is in conflict with the purposes for which the national forests were established and the recent Congressional Acts defining the management policy for the national forests. Based on Congressional legislation, particularly the National Forest Organic Legislation, which is one of the original State-ments of Purpose concerning National Forests, and the more recent Multiple-Use Sustained Yield Act, it is the judgement of this Coalition that the United States Department of Transportation has subverted the Congressional intent by declaring the West Fork drainage of the Gallatin River as an Economic Growth Center, making it eligible for a highway demonstration project under Section 127 of the Federal Aid Highway Act of 1970. The area selected is completely within the boundaries of the Gallatin National Forest, as I mentioned before, and currently contains public domain lands. Unfortunately, we don't have a detailed map here. Looking at the section map we see that there are about thirty-five sections altogether that are designated as an economic growth area. Twelve of these are presently under public ownership, yours and mine. Yes, I have a map too. It's just not big enough for everyone to see. This section concerning the growth area states that the purpose of demonstration projects is to "serve and promote the development of Economic Growth Centers and surrounding areas." This objective is not in accord with Congressional purposes for which the national forests were established, and appears to be in conflict with the National Forest Organic Legislation, as I mentioned

before, and I'll quote it, "to improve and protect the forests within its boundaries." The type of development taking place in the West Fork drainage can be typified by that currently taking place by the Big Sky Corporation, which is - as we all know - is a land development corporation and will, as such, be marketing home sites, second home sites, and condominiums. The Department of Transportation based its decision to approve this growth center, knowing it would promote and encourage this type of land development and subsequent land-use changes. Now, I have a question. Insofar as I know, and insofar as the members of this Coalition know, no consultation at all with the Forest Service was taken prior to designation of this area as an economic land growth . . . economic growth area. I am asking now if there is anybody here who has information to the contrary? Was the Forest Service consulted before this designation?

SKOOG: I do not believe that the Forest Service was consulted, no.

CUMMINGS: Perhaps we'll have further testimony on this from this gentleman?

UNIDENTIFIED: You want me to read from that? (Laughter)

CUMMINGS: The difficulty is, this decision to designate this area as an economic growth area was made on the basis - on the Department of Transportation's assumption - that there was going to be a good deal of economic development, and particularly land development in the area. On the other hand, the Forest Service is acting, and has stated, that they are going through with land exchanges Nos. 2 and 3 on the basis that most of the land in the area will be continued as range and as timber area, so we have two departments of the government working at cross-purposes, going from different assumptions and coming to conclusions that result in a consistent raping of the public interests.

SKOOG: The fact that a portion of this area will be developed does not mean that the entire thirty-five sections that you mentioned will be developed.

CUMMINGS: This has nothing to do with what I had to say. What I had to say was that one branch of the government is going forward on the assumption that there is going to be a large-scale development, that it's necessary to build a road to accommodate this large-scale development. Another branch of the government is going forward under the assumption that large-scale development will not occur.

SKOOG: I don't believe the Forest Service is under any misapprehension as to what development will take place in this area. There's been a number of people who have discussed the question of whether this route is properly a Federal Aid Primary System; should be on the Federal Aid Primary System. Let me read portions of two letters here. The first one was written by Albert G. Melcher, a

professional engineer, who is Director of Field Services, Rocky Mountain Center on Environment, from Denver, Colorado and he asks, as a portion of this letter, a question "The Federal Aid Primary System consists of connected main highways. The Lone Mountain Access Road is not a connecting main highway but is an isolated branch 9.7 miles long serving a privately-developed portion of a resort which is not a unit of local government or a municipality. I am curious as to the justification for a road of this type on the primary system?" This letter was addressed to the Federal Highway Administration and was answered by Mr. Bartelsmeyer, who is Deputy Administrator of the Federal Highway Administration. In his reply he stated "As an important route, serving a major recreational and vacation area, the 9.7 mile spur to the Big Sky Complex was considered eligible for addition to the Montana Federal Aid Primary System. It is properly integrated by connection with the Federal Aid Primary Route, namely, Federal Aid Primary Route No. 50, or U.S. 191. Spur routes such as this, with logical terminus at an important traffic destination and center, are acceptable for primary designation. The comparatively high estimated traffic volumes and the relatively longer trip distances involved for vehicles moving in and out of the area are typical of primary roads rather than secondary or local roads." Maybe an analogy to this might be a town built on the new city concept, where maybe a developer is developing a new city, say maybe of a projected population of fifteen or twenty thousand; this is a major traffic generator. The general public will be needing an access route to this city and, therefore, it would be eligible to be added to the primary highway mileage of the state involved, and this is basically the concept and the reason that this road is a primary highway. (Applause)

CUMMINGS: I'm sorry you didn't have the patience to wait for me to find my reference. I refer to Ronald C. Peterson, an article entitled "An Analysis of Title I of the National Environmental Policy Act of 1969" from a Journal called the Environmental Law Reporter from the most recent Volume year. The quote, "First, the Chief of the Forest Service is of the opinion that 'the record further shows that most of the selected lands in the land exchanges' - these are the lands we're talking about - 'will probably be managed on a long-term basis for forestry and range'" I don't know who of higher authority than the Chief of the Forest Service is but I think the contention stands.

ANDERSON: Thank you. We have several hands over there. Who is closest to the microphone?

WILLETT: I'm Jerry Willett. I represent the Bozeman Chamber of Commerce and I'd like to state that we are for the road between the Upper and Lower Village. As far as the route that is selected, we would like to urge the selection of a route that would conform to the natural lay of the land, particularly in avoiding excessive cuts and fills and high fills, and we endorse any route which

considers the preservation of natural environment and provides safe transportation. I would like to say that one thing about this public hearing that's happening is that everybody is getting a chance to speak what they feel, and I would like to go off a little bit like everybody else and say that I think that Big Sky has been doing a good job here getting it out to the public and I would like to see some of the environmentalists around start looking at some of the development that is happening all over Montana that is hidden, and we've at least had a chance to say what we think here. Thank you. (Applause)

ANDERSON: Thank you. The gentleman in the back there by the wall.

DAVICK: My name is Dorrance Davick. I'm a resident of Gallatin Canyon and I'd like to read a statement prepared by the Gallatin Sportsmen's Association. This is addressed to Mr. H. J. Anderson, Director, Montana Department of Highways. "Dear Mr. Anderson: We appreciate the opportunity to comment on your Draft Environmental Statement and road alignments. Apparently, the important decisions regarding need and finance for the road have already been made by state and federal agencies. The citizen participation appears limited to preferred location within a predetermined corridor and comments on the Draft Environmental Statement. We have no preferred alignments within the corridor. Our concern is that one common error of road construction in the mountains of the west is to destroy many scenic assets with road scars. We hope that this has been corrected. We would also suggest that it would be more equitable if Big Sky, Inc. built the road, meeting state standards, to the base of Lone Mountain and gave it to the state to maintain. The Draft Environmental Statement is largely limited to a section of road for immediate construction with funds already approved. Statements should be available prior to project approval, not after, as this appears to be. The intent of Public Law 91-190, and guidelines, indicate that the total long-term effects of all activities which will likely result must be analyzed prior to approval. The overall impact of vehicular traffic and demand for road improvement in other locations should also be reported in more detail. For example, the extension of the road to Ennis is merely mentioned by saying there is support for it. It does not state there is also opposition to this road extension, nor does it include those environmental impacts. Also, the possible future increased traffic on Highway 191 is ignored beyond 1992 ADT projections. Increased traffic from Big Sky will in turn increase the pressures and needs for improvements in the narrow canyon portions of Highway 191 alongside the Gallatin River, a trout fishery of national significance. This would have some predictable consequences on this valuable trout fishery. These are two examples of the error of trying to confine environmental impact studies to individual segments of a road being considered for immediate construction. This must be rectified in the environmental statement. The Fish and Wildlife Environmental impacts analysis are inadequate, lack documentation and are impossible to accept from the viewpoint of people concerned about fish, wildlife and environment. For example, how

much scientific documentation can be offered to support such general statements as, and we quote 'Some adjustments in the patterns and behavior of wildlife in the area can be expected. Although not as important as some other areas in the Gallatin, the West Fork does support a variety of wildlife species. Their adjustments will vary, with some species avoiding the area and others being attracted to it for one reason or another.' Little mention is made about the presence or absence of animals, birds, fish, rare or endangered species, and other relationships to roads and year-long people activities as the result of roads. A brief survey among our members and published information show the following wildlife using the West Fork drainage: elk, moose, mule deer, bighorn sheep, mountain goat, black and grizzly bear, blue and ruffed forest grouse and, in addition, there are numerous other birds and small mammals. Areas accessible to motor vehicles the year around are generally not used by some important game animals unless the area is densely forested or certain weather conditions make it necessary for the animals to forage near the roads in the open. Elk, mountain goat, bighorn sheep and bear require habitat with wilderness-type characteristics. Roads, commercial development and year-long activities effectively stops the production of these species in a much larger area than that occupied by the road and commercial developments. To imply the animals will merely avoid the area and live happily in another part of the forest shows you have not considered the already-known information on population dynamics and ecology of natural wildlife populations. The environmental statement will not be acceptable until there is a credible ecological analysis for fish and wildlife in relation to the entire road, and to the entire surrounding area influenced by the road and subsequent development. Several investigations concerning elk, economics and recreational development in the Gallatin area are completed or underway. However, this information does not appear to have been incorporated into this draft." Thank you.

ANDERSON: Thank you. There's a gentleman standing here with his hand up.

O'NEIL: Am I on this broadcast? I'm only a seven-year Montanan. I'm a Coloradan by birth. I've seen what Big Sky, Ski Country, U.S.A. can do in Colorado. It has been a multi-million dollar industry for the State of Colorado. It hasn't cost the people of Colorado one dime. The people of Colorado have enjoyed a multi-million dollar income to their state with no outlay. This is a fantastic thing, you might say. It's just exactly like Big Sky, Montana. It doesn't cost you people a crying dime to bring all these millions of dollars into the State of Montana but the money is here; take it off the top; believe it; enjoy it; spend it, right out of your own pockets. Big Sky, Montana is a beautiful thing. Sky Country, U.S.A. has done this same thing at Vail, Colorado; it's done it at Aspen, Colorado. You kid yourselves. Don't kid yourselves, please. This has brought money to the State of Colorado that would have never been brought into the State of Colorado, and Big Sky,

Montana can bring millions of dollars that have never come to the State of Montana - would never come to the State of Montana - had not this project been brought about.

ANDERSON: Could we have your name for the record, please?

O'NEIL: My name is O'Neil.

ANDERSON: Your first name?

O'NEIL: I'm a seven-year Montanan; I'm a Coloradan by birth.

ANDERSON: Your first name?

O'NEIL: Homer H.

ANDERSON: Thank you.

O'NEIL: I was named after a blind Greek poet. (Applause and laughter)

ANDERSON: Thank you.

O'NEIL: . . . and that's sure a hell of a thing to happen to a little Irishman, isn't it! (Laughter and applause)

ANDERSON: There's a gentleman over there. . .

O'NEIL: But now listen . . . wait a minute! (Laughter)

ANDERSON: Excuse me, I . . .

O'NEIL: Wait a minute! I want you people to know that this is something that can bring millions of dollars to your economy; right here, right now! If you vote it out, I'm sure you're voting out something that's rather big. I think that if you would take a long look at what Colorado has done with something like this and look for yourselves what this can do for you today, I think you're not going to want to go - shut me off today, shut me off tomorrow. Bring it in, let the people bring the money to you and then when you get the money in your own hip pocket, spend it and enjoy it, but Big Sky, Montana can bring a million dollars to you today. Bring it in, enjoy it!

ANDERSON: I think there's a gentleman right there beside you that would like the microphone.

STEIN: I'm Ben Stein, State Senator from District 14, Park County. First of all, I'd like to say that I've appeared before a number of these highway hearings and testified on various aspects of highway locations, and this is the first hearing at which I've ever attended where demonstrations were allowed during the testimony. I think it's quite inappropriate during a public hearing to vent our

emotions in this fashion and I'd like to ask whoever is in charge whether we could keep the meeting in order from now on as part of the legal process of government?

ANDERSON: Yes, sir, we'll do our best. Although it is very close in here, we ask everyone's indulgence, please.

STEIN: I do have a brief statement to make. Following the last gentleman, the gentleman from Colorado, I'd like to say that I am also an immigrant. I came from Illinois about thirty years ago and I've lived in Park County most of the time since. I've served in seven sessions of the state legislature. I have a brief statement that I would like to read. Before I read this statement I would like to say a word about where this program originated, this Rural Economic Growth Center Program. During the last two days I read the Congressional hearings. During 1960, the year in which this program was formulated - it's a brand new program - a law was passed on December 31st, 1970, just prior to the opening of the last session of the legislature. This program originated because of the crisis developing in transportation around the metropolitan areas. It didn't develop because of some . . . of the nation's benevolent desire for amenities in the rural areas. The idea was to pour a little bit of money into the rural areas to take some of the stress off of the great metropolitan areas, thereby not having to double the transportation facilities there where they are having so many problems. With that, I will read my statement. "If Montana were to set its own priorities and highway needs, this project would be near the bottom of the list. Within a hundred mile radius of Bozeman, and within this highway district, we have projects stalled for lack of funds. There is one bridge across the Yellowstone River, used daily by a fair-sized community, in dangerous condition and without funds for repair. The largest and busiest ski area in Montana is served by an inadequate road sixty miles from here. But Montana was allocated a cupfull of the federal custard - a dish prescribed in Washington - the same recipe spooned out for New Jersey and New Mexico and Iowa. For the Montana Growth Center Project, Washington has approved a two million dollar outlay of federal and state road funds under the general pretext of reversing the trend of migration to population centers. Under any conceivable cost-benefit accrual, this is a fantastic outlay to keep a few skiers and golfers and their cooks and instructors out of the New York and Los Angeles traffic for a few days. The federal desire to alleviate the metropolitan population crunch is the reason for the program that finances the Lone Mountain Access Road project, and the public will pay to transfer the roar of traffic from the big city to the 'Big Sky.' As an elected official, familiar with the needs expressed by citizens of Montana, I say we do not need 'Fun City' constructed within the Gallatin Forest at public expense. Some Montanans with a different opinion welcome Big Sky Corporation in fostering a broader tax base. I suggest that if it is going to cost between three and four million tax dollars to assist this type of enterprise

(approximate funds spent and projected for Big Sky), then we have consented to a very hazardous public policy. It would be appropriate for the State of Montana to refrain from participating in the promotion of mountain real estate, and henceforth to beware of public-spirited salesmen of subdivisions who want to broaden their tax base." (Applause)

ANDERSON: Thank you. The gentleman standing up there.

FISCHER: Mr. Chairman?

ANDERSON: Yes.

FISCHER: I'm Ray Fischer, Director of Public Relations for the Montana State Chamber of Commerce, Helena. "Recreation, tourism and land development are now, and will continue to be, an intricate part of Montana's economy. These economic activities are not desecrating our lands but are making them more productive, and in most cases, are increasing their aesthetic values. The proposed road and its funding, which is being discussed here tonight, must become a reality if the development of Big Sky is to become part of Montana's economy. Therefore, the Montana Chamber of Commerce supports the total concept of Big Sky and the construction of major roadways pertinent to its access and full operation." Thank you.

ANDERSON: Thank you. Now, the gentleman with the glasses on . . .

MANNIX: My name is Con Mannix. My grandad homesteaded in this general area in '64. I'm well aware of all of the environmental aspects of this area. I only have to make one trip to Missoula to visit with my in-laws to understand what could happen here. As far as I'm concerned, Big Sky is a real advantage to this area and I'm all for the development of this type of industry. I think that the highway should be paid for by the appropriated funds. Lord knows that we're spending a lot worse money in other areas like Vietnam and etc.

ANDERSON: Thank you. (Applause) Just a moment, I've got a gentleman right over here.

FISHER: I'm Homer Fisher, a lifetime resident of Gallatin County, a taxpayer in Gallatin Canyon and also other parts of the county. I have but one question I want to ask - I will state for myself and my family. We're one hundred percent for Big Sky, for our Federal Highway Department, our State Highway Department or any department that will insist on helping this project to go. I think we all will owe them a lot because we sit by here for years asking and trying to get help from your Forest Service, your Highway Department; we got none. Now that the project has come to the valley, which might help us, then we have a few minor ones that oppose it. They don't want to spend a few dimes of that

tax money from our gas to go ahead with these roads and things that we've needed and have needed for years. A good many of them come to this country and all they done was help the environment - to spoil it. They scattered garbage along the roads, they buzzed the highways, they run people off the roads and killed one another, but you don't hear any of them saying anything about that now, no! That was real nice, but the thing I want to ask, is the railroad and the Highway Department working in accord with our Big Sky so as not to interfere with the project that has come to our valley, that will help us, not only tax-ways but penny-wise in every way? Thank you.

ANDERSON: Thank you. The gentleman standing right there, yes. Come up to the microphone please.

JACKSON: My name is Kail Jackson. I'm a junior in government at Montana State University. More importantly, I'm a twenty-year resident of Bozeman. This is about as good as I can do. (Laughter) I'm speaking only for myself. First, I have a question concerning the environmental impact of the area, which I'm sure we're all concerned about. I'd like to personally know what the other adequate local and regional controls on land-use, and what they are, for the impact that Big Sky would have, which this road would help?

SKOOG: I believe there's been considerable discussion by various groups on zoning and these matters. I'm not sure that they are really related to this road project and I would hate to try to speak on this because I'm . . . none of us are as well versed as the people who have tried to promote certain planning and zoning in the Gallatin area.

JACKSON: Thank you. I'd like then to make a statement. That question is basically for my own knowledge. I'm just interested in that. First, I'd like to say, for those of you who are here and worried about economic development in Gallatin County and in Montana, I don't believe there's an environmentalist in the room that isn't just as worried. No one wants to cost a job, and we all want to get jobs in Montana; and recreation and tourism are probably two of the cleanest ways to do it. The thing that I think we're all worried about is the manner in which it's being done, and we're worried about the impact and trying to keep the impact, as much as possible, as small as possible, and if it would come to the point where this is really a realty development - which it looks like it may be; in fact, that's what the company has stated that it is, with recreation as a sideline - then we should look at that closely. I was an intern and therefore did research on Montana's Constitutional Convention and one of the things that I was assigned to do was look into the responsiveness, the bureaucracy, for Montana's bureaucracy, as it was one of the duties of the convention to try to make the government as responsive as possible. During this time, specifically, one of my jobs was to

make a quick check, which wasn't very much in depth, into the Highway Department and we found that there was a considerable amount of dismay with the Highway Department in Montana, which was, basically, due to the apparent - whether it was real or not - lack of concern about long-standing problems in Montana. A gentleman from the other side of the room a minute ago said that we've needed these roads for years, and a lot of people are arguing against them. I think the point of many of the people here that are arguing, from the environmental side and elsewhere, is that there have been roads that we've needed for years. I had several complaints given to me at the convention concerning, for instance, an overpass in Missoula and the Bridger road out here, which is in desperate need of paving, apparently, according to this resident, and has meant to do so for many years, and the question that I would ask you is, when you're looking at . . . trying to look at the benefits to the public in Montana and the goals you're trying to attain to roads, what is it that made Big Sky look like a good area to get federal funds and state funds for developing a town which - when the state and federal funds for this development and for building these roads are generally meant to be used to expand towns and get people away from urban centers as living areas - when the cost of living in the Big Sky development will be so tremendously high? If the cost is going to be so high, if you won't have this deurbanization - because there isn't any rural low-income housing in the Big Sky area - the questions . . . the thing that would bother me, and I think bothers many of us is, when you have the pressing needs, such as Bridger and the bridge that was mentioned a minute ago, and the Missoula overpass and all these complaints about things that need to be done, why is the money being diverted for a road between the Gallatin highway and the Big Sky area, especially with the questionable ecological impact? I know that's a general question. I'm not trying to be baiting, I'm really concerned with this.

BECKERT:

Well, in the first place there are quite a few different highway programs. There is secondary system, primary system, interstate system, and now these funds for this economic growth project. Well, now, these funds can only be used on an economic growth project, this twenty percent that is added to the normal federal funding, in this instance. Now, consideration has been given to making this a secondary road project. This type of action would have taken the action of the county commissioners involved. This action was not forthcoming. Therefore, this could not be funded from the secondary funds that are being used on the Bridger road, for instance. Naturally, this is not part of the interstate system, so you couldn't use the interstate funds. This was one of the problems that we faced was that, inasmuch as interstate funds could not be used, inasmuch as the county commissioners did not elect to make it a secondary route, it could not be funded as a secondary route. If it was going to be funded as a Federal Aid Highway, then it had to be on the primary system. Now, the Montana Highway Commission took their prerogative to establish a

primary route, and that was the initial action that was required before primary funds could be spent on this particular route.

JACKSON: I realize the difficulties that you have in this area with funds allocated to different purposes. My point basically is this, that with the tremendous needs that we have - and for those of you from Bozeman you all know the needs, for instance, in Bridger and in this area, and if there's anyone here from Missoula, you know about the overpass problem - with all these needs that are very obvious, one of our points is, basically, that should we be diverting money for a road which will drive into a town that's being created to service, basically, the most affluent parts of the American society. As really I believe - perhaps my figures are wrong - but I believe the least expensive lots are \$9,000 and the least expensive condominiums someone said were \$27,000. Correct me if I'm wrong. But I do not see how this can be used as a growth area to deurbanize, which is supposedly the point of the growth money that they're talking about, and with this in mind, I would question whether any money should be spent in this area, with these other pressing needs. Thank you very much. (Applause)

ANDERSON: Thank you. Yes, sir. Come up front to the microphone please.

MICONE: I'm Mike Micone, representing the city of Butte. First of all, I would like to point out that the city of Butte . . . we consider ourselves a close neighbor of the city of Bozeman and the Gallatin Valley . . . so with me tonight - we certainly don't want to go through introductions but there were some forty to fifty interested residents of the city of Butte who came down this evening. It was told to me that we would probably have had eighty to a hundred except somebody had to babysit. But we do have various aspects of the community who were interested and thought it important enough to make this trek down to the Gallatin Valley. I think it's important to point out that this is a very large state. I believe there are some five people per square mile that inhabit the State of Montana. I heard it mentioned once that the State of Montana was so large that they had to stack it upon one another and I certainly believe that. Because of this low density I believe it's good that we are looking to protect our environment before it becomes to the point of some of our eastern neighbors, but not so much that we shield it and not be able to use it. I think it was mentioned earlier by one of the speakers that we must protect the forests and we cannot destroy the many scenic aspects of this area. Well, I would ask the question, and this is in the form of a statement, who are we protecting the scenic area for? Because of our residents, and if our visitors to the State of Montana cannot enjoy the scenic wonders of our great state, I feel it meets no useful purpose. I must commend the State of Montana and the State Highway Department on the job it's done on it's interstate system. I, for one, I am not what you might call an outdoorsman or one that partakes of the wilderness area, but in traveling the highways, which

I do quite often, I have been able to enjoy some of the more scenic wonders of our state because of the job the Montana Highway Department has done. It was our intent coming down this evening . . . or we were under the impression that the hearing was on alternate routes, and we were intent on encouraging the State Highway Department. The city of Butte, of course, and the residents of the city of Butte, are not entirely concerned as to which route is taken but that a swift decision be made by the Highway Department so that the project may proceed and come to a speedy conclusion. We of Butte, of course, are hopeful of realizing an impact because of the project, not only an economic impact, but one of visitors to our community. I think that we in Butte can say that we have witnessed what has happened by scarring the land. We certainly don't want it to happen to this area but we certainly don't want it to be shielded and build a fence around this area so that we in Butte will not be able to come down and visit the area. We certainly encourage the Highway Department to come to a speedy conclusion of the hearings and a decision and proceed with the routing of the highway. Thank you, gentlemen.

ANDERSON: Thank you. (Applause) I might mention the decision that he is referring to. At such time that a decision has been reached and has been approved by the Federal Highway Administration, it will be advertised in your local newspapers and, hopefully, circulated enough that everyone will know what the decision is. Now, the lady standing way in the back there. Can you reach the microphone?

HAGLUND: Yes. My name is Dayle Haglund. I'm reading a prepared statement from State Representative Dorothy Bradley, who could not be here this evening. I quote from Miss Bradley. "I wish to state my opposition to the U.S. 191 Spur based on my dissatisfaction with the environmental report of the Montana Department of Highways. I will also submit with this testimony a more thorough documentation of these complaints which were embodied in a letter I wrote to Senator Metcalf on March 25th of this year. I find the environmental report opinionated, skimpy on ecological facts, and sarcastic about what its authors refer to as the 'do-nothing alternative.' More seriously, I find it in conflict with other material and incomplete, in that the whole contemplated road project has not been included. I will briefly discuss some of these complaints. No. 1. The second annual report of the Council on Environmental Quality of 1971 makes it clear that all contemplated activity must be included in impact statements. It is certainly no secret that the extension of the road across the mountain range is a possibility sometime in the future, but this portion of the project is specifically excluded from the environmental report. I am convinced that according to the guidelines, the whole project should be considered in the impact statement; not just the section proposed for immediate construction. Furthermore, it is interesting to note that the Montana Highway Commission based the West Fork growth area application on the premise that growth designation would aid Madison County, especially if the road extended directly

into that valley. No. 2. I mentioned the problem of conflicting information. The economic growth center proposal conflicts with the environmental report. The growth center proposal explains that high priority is assigned to this project because if transportation is not provided, then private capital committed to the area will be withdrawn. On the other hand, the environmental report expresses certainty that Big Sky will proceed with their development, and if transportation facilities are not provided they will be forced to use existing, less expensive, less safe roadways. No mention is made of pulling out private capital. Another conflict exists in the environmental report which states that land-use changes which are presently underway are not being caused by the proposed highway construction. However, Mr. Lewis Chittim, past Montana Highway Engineer, suggested a southern boundary change of the Spanish Peaks Primitive Area because of a possible future road. This proposal involves changes of land designation and land-use. In my opinion the change would certainly be caused by the proposed highway construction, although it concerns the part of the road which was summarily excluded from the report. No. 3. Less important complaints deal with the project-serving bias of the report. Page 24 states that considerable public sentiment has been expressed supporting the possibility of a road over the mountain range. It ignores the fact that there has also been considerable public sentiment opposing this possibility. Page 33 states 'The change in land-use from ranching and timber harvesting to primarily recreational use will be desirable for future generations.' On what factual ground is this statement made? Should such a land-use change be encouraged? And to what financial class of people do second homes, expensive skiing and golfing appeal? Page 2 states, and I quote "The economic impact of this development will be felt by a large area of southwestern Montana. Gallatin and Madison counties will share in a substantially larger tax base. Restaurants, gas stations, hotels and motels, airlines and other tourist-oriented businesses will benefit. Employment at Big Sky will provide approximately 300 jobs.' I am wondering who will pay the costs of the new airport, the roads, the sewage and garbage disposal, the education of the children of 300 employees, and all the other services. Why is no mention made of the costs of the economic development, as well as the benefits? In the Lone Mountain case, as elsewhere, associated costs may far exceed the benefits. Is this not the reason for having an impact statement analyze the socioeconomic benefits? Based on the conflicting and inadequate nature of the environmental report, I am opposed at this time to Project F 20 (1), U.S. 191 - Spur." Thank you.

ANDERSON: Thank you. The gentleman right here.

WRIGHT: I'm John Wright from Bozeman, Montana and it was my understanding that this was to be a hearing in accordance with Public Law 91-190, Section 102(2)(c), the State of Montana Department of Highways, on this environmental statement and some discussions for road options.

Some questions have come up about habitat and environmental impact and so on. I do not see how this can be assessed until this problem is solved; which option is the one. I find it very difficult to follow the statement of the young lady about 'skimpy ecological knowledge.' I have here in my hand two bulky documents. The co-principal investigator of these was Dorothy Bradley's father and if they're skimpy, I don't understand it. (Laughter)

ANDERSON: Thank you, sir. Go ahead, sir. Quiet please so everybody can hear.

SKOOG: With regard to the five alternates that we have presented here tonight, we will conduct some additional studies as to the problems involved in these with the input that we receive. Based on the publication of the Draft Environmental Statement and based on the testimony presented at the public hearing, a recommendation will be made to the Montana Highway Commission as to which of these alternates is proposed and it will be up to the Highway Commission to select the alternate. We are not going to present a recommended alternate here tonight. We want to hear what the public has to say with regards to the total project and to the alternates.

ANDERSON: Someone else? Yes, sir.

KEIGHTLEY: My name's Bill Keightley and I live south of Bozeman. As a citizen I want to go on record as opposing the Department of Transportation's designation of an Economic Growth Center in a national forest to promote commercial development, and as a taxpayer I want to go on record as opposing the use of tax funds to pay for a road into a private real estate development. But the question I have for the Highway Department is perhaps one for your lawyers, and I'm quoting now from Policy and Procedure Memorandum 20-8, in its Paragraph 3, Applicability, and it says " . . . this applies to all Federal Aid Highway Projects." It says "If preliminary engineering related to an undertaking to construct a portion of a Federal Aid Highway Project is carried out without Federal Aid Funds, then subsequent phases of the work are ineligible for federal aid funding if the nonparticipating work was done in accordance" - was not done, pardon me. It says that "the subsequent phases are eligible for funding only if the nonparticipating work was done in accordance with this Policy Procedure Memorandum." Now, some of you gentlemen stated tonight that you did do the engineering on the first three miles of this road. I believe you stated that it cost something like \$212,000 or something of that sort, and yet that work was not done in accordance with this Policy Procedure Memorandum which requires a public hearing, a corridor hearing such as we're having tonight, and it would appear from my reading of this that you have violated this policy by doing part of the work without the hearing and then trying to continue the work. Would you care to comment on this, please?

BECKERT: The funds that I mentioned earlier were used partly on the first

three miles and partly above that. We did not, however . . . although we had done some preliminary work above that common point shown by these various routes, we did not proceed to the point of acquiring any right of way. It was just study purposes and we do not believe in any way, shape or form that we took any action to eliminate the possibility of obtaining federal aid funding for this upper portion of the route which we are discussing here tonight. As a matter of fact, although we had spent some state funds initially on that, since that time we have been working with federal aid funds. This project was approved by the Federal Highway Administration. They have indicated that there should not be any problem whatsoever as long as we keep within the federal aid procedures in funding any right of way acquisition or construction on this project that we are discussing tonight.

ANDERSON: Thank you. Before we go any further, any of those that would like a copy of this transcript tonight, would you sign this, give us your name and mailing address and you will be furnished one free of charge. Sign it before you leave tonight and you will get one. All of those who spoke will get one automatically, so anyone else that wants one, please come up and sign this register. I have one question of Mr. Wright. Could you leave us the names of those two publications that you referred to in your comments please? Before you leave tonight.

WRIGHT: They're not publications, they are proposals from which there will be publications in process.

ANDERSON: Very good.

WRIGHT: In fact, I think you used some of the information in your impact statement . . .

ANDERSON: Environmental statement.

WRIGHT: . . . from these proposals.

ANDERSON: Very good. That's what we want. Thank you. Now, someone else. Yes, would you grab that microphone?

BERG: My name is Russell Berg. I am from Bozeman, Montana and I'm speaking as a citizen. I would like to read a letter that I . . . a portion of a letter that I got from Bill Worf, who is the Chief of Recreation and Lands for Region No. 1 of the Forest Service. He's headquartered in Missoula, Montana and Bill Worf states "The National Forests in the western states were created by presidential proclamations, thus reserving parts of the public domain from settlement." Now, this is what the Forest Service was created for, is to reserve parts of the public domain from settlement. This is one government agency. Now we have another government agency, the Federal Highway Transportation Department,

who is building a road for the sole purpose of creating settlement within the National Forest boundaries. This is the conflict that we were talking about. Now, to comment in regard to what the man from Butte said, that we were trying to shield this country and prevent people from using it. This is not so. Let's analyze how the Forest Service has allowed to protect this land from private settlement and yet allow the public to build on it. They've done a good job of this and I concur with what they have done. In the Shoshone National Forest between Yellowstone National Park and the forest boundary near Cody, Wyoming there are ten lodges. All of these lodges consist of overnight accommodations and some have cabins - or in the form of rooms - and some of them have liquor available and some do not. One of them happens to have a ski area and this ski area is on Forest Service land, has a warming chalet on Forest Service land, and it has a food service on Forest Service land. So, you can prevent . . . I mean, you don't necessarily need to own the land privately or sell it off as a second home in order to allow the public to enjoy the national forest lands. As a matter of fact, the Forest Service has discouraged this. The Forest Service will no longer issue any special-use permits for a private home in the Gallatin National Forest because the land is of more value to the total general public than it is to any one private individual. Now, this Highway Transportation Act will aid Big Sky in selling land to private individuals which is, of course, exactly the opposite of what the Forest Service is doing. They are refusing to give use-permits to private individuals. On the other hand, private individuals that have had Forest Service permits are allowed to continue them because it would be very bad, and inhumane I might even say, to say that somebody that has already established a home in the forest would have to give it up. But the foresters are not allowing any additional private homes in the forest and that is how they are trying to live up to the purpose for which they were created, and that is to preserve portions of the public domain from settlement and this says the Act would have the opposite effect. I might also say, it's not in the public interest. We have been thinking about the Southwestern Montana public when we've been talking about the development of the road. We've got to remember that the national forest lands belong to all 210 million people who live in the United States. Then it would be more in their interest to have this land available for camping and scenic drives and that, than to have it sold to private individuals. So if sold to private individuals - if we get too many private individuals within our national forest boundaries we may have troubles building campgrounds within our national forests. The Gallatin Canyon people - I've read in the paper - do not want any more campgrounds in Gallatin Canyon. Right now the Forest Service still might be able to build them but if you increase the number of private landowners, like up to ten thousand, there would be enough people to prevent the Forest Service from really establishing any more campgrounds on Forest Service land and this definitely would not be in the interest of the general

public or the 210 million people in this country that own our national forest lands. Therefore, I think that since the 200 million people with tax dollars it would be costing these 210 million people, it would be a shame to have them spend money that is not in their interest, but actually may prevent them to use the lands in the most desirable and a method of giving them the most pleasure. Thank you.

ANDERSON: Thank you. (Applause)

CORCORAN: Mr. Berg, may I ask you a few questions?

BERG: Yes.

CORCORAN: Are you a taxpayer in Gallatin County?

BERG: Yes.

CORCORAN: Do you own a home?

BERG: No.

CORCORAN: Why don't you own a home?

ANDERSON: Excuse me, mam. Could we get your name?

CORCORAN: I'm Mrs. Donald Corcoran.

ANDERSON: Would you speak into the microphone please.

CORCORAN: I'm Mrs. Donald Corcoran.

ANDERSON: Thank you.

CORCORAN: I work in real estate. I happen to know that Mr. Berg does not own his own home. What do you pay taxes on?

ANDERSON: Excuse me.

UNIDENTIFIED: Inaudible.

ANDERSON: Excuse me, mam.

CORCORAN: Okay.

SKOOG: I would agree. I think this is irrelevant. I don't think this is a proper type of testimony.

ANDERSON: We don't want to get into any arguments here, personal arguments.

SKOOG: No personalities in the thing!

ANDERSON:

Please! It's too close in here to be starting any fights. (Laughter) Do we have testimony in favor of either of the alternates; proposals that we have shown here? Yes, sir. Would you come up to the microphone, please.

DEVINE:

My name is Jack Devine. I'm a representative of Cascade County. As all my friends say, I'm a 102-day veteran. I see a lot of veterans in here with me. We worked real hard. I think one thing in every representative's and every senator's mind is . . . Hello, Pete . . . (Laughter). . . we sit there many, many day for day and, you know, we were really locked up. We sit there and we have a chance for an industry in this state. Now, we look around, and I can talk to the older people who can get sick sitting here because their kids can't stay here; there's no jobs for them. I can look around at you younger people and you can testify, or you can get your 'thing' but we sit there as parents, and I have seven children, and we look at "how do we get you jobs?" This is the biggest industry - probably next to the Montana Power, God bless them. They pay 52% of the corporation tax. I don't own any of the stock. I own stock from my company . . . How are you, Ed? . . . I look around and I'm glad I came up here. I see a lot of friends that are 102-day veterans, but really, this is a chance. I went up personally to the Big Sky and looked today. I saw a lot of rocks turned over and everything, and I really tried to make a side deal with Chet Huntley to move this thing to Cascade County. (Laughter) I don't know how you people appreciate it, and Chan Libbey, a very good friend of mine. I'm a beer distributor; I'm also a representative. This is very rare in the public annals. You know, in the beer business I'm in an "in" group because the young people love me, and I have seven children. (Laughter) Anyway, Chet told me he's going to go ahead with this thing. He won't move to Cascade County. In the 102 days, we sat and we argued against "who wants the sales tax, who doesn't want the sales tax" but every man up there, and there isn't a man in this room . . . the 102-day veterans, it's hard to get us all to stand up. I probably shouldn't be up here even admitting it, but we want young people to stay in this state and we need industry in this state and this is a chance. I went up there and I looked at that thing and I'm proud that that thing is up there and, Mr. Huntley, I'm proud and I thank you for coming here, and I sure wish you could come to Cascade County because we'd have this many people, fifty times this many people, and everyone would be one-hundred percent for you. I went down to a legislative council meeting - and you can check me - in North Dakota, in South Dakota and in Nebraska, where, incidentally, they have a unicameral legislature, who you can record me "against to be against" (Laughter) . . . and I live in the city. But you people who live out here, you get a great, great politician and you get him elected two, three and four times and you're going to have a great power, and he'll swing a lot of weight. It's sort of a crime, you know, living in a big city. Like Cascade County, we have a lot of welfare people; we have a lot of people

who come in. It's really nice. You move to Great Falls . . . We have your people. They all come up there. They get on our benefits and other things and we're kind of called down. I wish, really Chet, if we could just bring them out and get a few people to bring it up, you could do a lot of good for Cascade County. But this is an opportunity for you people. It won't make any difference to me business-wise and anything else-wise. It may hurt me ecologically now because I'm running for the senate. But I'll tell you, I would love to have everyone of you young people - and I think everyone of the older people would love to have all of their kids just know they can get a job in the state and not turn around and, you know . . . you call them on little things. You never get mad at the sounds of the big things. It's the little things as a father and mother you get mad at but, God, it's sure nice if you can just keep them at home. I'm telling you, this is going to keep a lot of our people home and I would just . . . as a public citizen who is probably just being me, I am for a thing like this. You look at the State of North Dakota, as I was saying, the State of South Dakota, Iowa . . . and I went to a legislative council meeting and they have sold their state lands. They have very little land left. They've sold over a million, two-hundred thousand acres in North Dakota because the state is up against the blade. They put them out on a public bid and they will take a twelve-year deal, and you take a cow, a per cow unit, and you take, maybe \$1.25, or whatever it is, you'd beat the price of this land on what they take in on a unit. Now, we are up against this thing. We have 700,000 people living in the State of Montana and we're really faced with a tough proposition. We need industry, and as a native Montanan, you know, I love it and I think I told Mr. Huntley's gentleman, Ed, over there, the manager, today I said "I love them to come in with big wallets just as long as they went on that airplane and go home" because of being big Montana, we have five people per mile, and we love it - having five people per mile. If there was seventeen people per mile, they'd probably be running all over each other, but this is an industry; it's a beautiful industry. I drove through the thing . . .

ANDERSON: Excuse me, sir.

DEVINE: . . . before I came down here and we would really like to have it.

ANDERSON: You're in favor of this project, I take it.

DEVINE: I would say, yes! (Applause)

ANDERSON: There's another gentleman over here that has a question. Thank you. Thank you, go ahead. Come up to the microphone, please.

BROUDE: Folks, it is . . .

ANDERSON: Would you speak into the microphone, please, and give us your

name.

BROUDE: My name is Steve Broude. I happen to be the former owner of Steve's Country Store in Bozeman, Montana. I am not retired, I am interested in us. That means every one of you here in the complete State of Montana, because I'm running for the legislature. I'm not up here because I want to be here, because I'm out to win, but this has nothing to do with this particular project. I happen to live right up here in the canyon, five miles above Big Sky, and if you want to be interested in your environmental condition here - it is much better than smokestacks. I admire the individuals who have invested this money up here to bring something that everybody can enjoy, not only us Montanans, but everybody outside of the State of Montana. I am sure it is going to bring you dividends. I can't possibly say it is going to lower your taxes. This is entirely up to you, and I want to tell you something about the youth of our country and this is, I quote, "Nothing is nearer the hearts and minds of our parents than our intense interest in youth and in the places they are destined to fill in our society. He, that we now call a youth, is some day going to talk to you, sit where you are sitting and, if he pleases, carry on the policy that you admire and sponsor or that you oppose and detest. He will control your organizations, your cities, your books and all the communication medias. Yes, our youth of today will be the leaders of tomorrow. In their hands will rest the fate of American humanity. It is precisely for these reasons that the enemies of our country, always in presence, seek to capture the minds of our youth. They hope to control the thinking of our young people, and to poison their minds against the traditions and principals that have made our republic great. There are many fine organizations with their emphasis on personal character building. Good citizenship and leadership training offers a tremendous opportunity to combat such evil forces. This is one of the primary reasons why all of us should be active supporters of our youth. If you want this country as it is, you'd better trust our youth and see that Big Sky gets the road." Thank you. (Applause)

ANDERSON: Thank you. Before we go any further, I would request that the next speaker please make his remarks about what we are here for tonight, the discussion of a highway location. I see a gentleman has his hand up right over there. Would you reach that microphone, please.

WRIGHT: This is John Wright again. We are in the process of preparing a comprehensive report on everything we've done in this investigation so far. You are on our mailing list. You will get one.

ANDERSON: Very good.

WRIGHT: We are also willing to provide you every scrap of information, starting from geology to "Dickey Birds" on this area and, of

course, we're not going to tell you where to build the highway or anything else, but we'll give you everything we've got and everything we give you can be contested. But what we'll do will be done by the best expert people we can get, in the best manner, and the people that might want to contest it might consider, there are court actions.

ANDERSON: Thank you, sir. We appreciate your offer. Now, the gentleman in the glasses right here. Step up to the microphone, if you can get through there.

ERICKSON: I just demand equal time for a minute. You've allowed Butte to speak and you've allowed Great Falls and Cascade County to say something. My name is Claude Erickson. I'm from Livingston, Montana. I have lived in Havre; I have lived in Miles City. I have talked to hundreds and hundreds of people during the past two years about this particular project. I think I can say honestly that the vast - the very vast majority are for this project and we all hope that it comes to a speedy conclusion. The Chamber of Commerce of Livingston is for this, as are most of the organizations, civic organizations, in Park County, and I'm not going to take the time to read this editorial that appeared in the Livingston Enterprise tonight but I do want to enter it as a part of this public record. Thank you very much.

ANDERSON: Very good. Thank you. (Applause) I might mention before everybody leaves that we will be accepting written testimony. Send it to the Montana Highway Department in Helena for the next ten days. This written testimony will also be attached to the transcript. Now, I saw a hand over here in the back. Yes, would you try to get a microphone.

PERRY: I'm Dave Perry from Bozeman. I've got a short statement I'd like to make. The President's Council on Environmental Quality Interim Guidelines, Section 5-B, states that the statutory clause "Major federal action significantly affecting the quality of the human environment is to be construed by agencies with a view to the overall cumulative impact of the action proposed." We have in this area two proposed projects, a federally financed road and a land exchange which will put all of the land in this area into the hands of what the Department of Transportation has called "a large and capable potential developer." We had environmental impact statements on the road and on the land exchanges, but no assessment of the cumulative impact of these two actions. In light of this, I urge that before any further action is taken, a lead federal agency be designated to assess and report to the public the cumulative effect of all proposed disruptions in the West Fork. Thank you.

ANDERSON: Thank you. I want to take this time to apologize for the people out in the bar area. This is kind of a small room and I hope

you are getting all of this. (Laughter) I know it's pretty impossible. The gentleman right here has a question.

DOUGHERTY:

Yes, Mr. Chairman. May I suggest that after I get through speaking, those of us in this room who are obviously thirsty might exchange places with those in the bar. (Laughter) . . . who are obviously talkative. (Laughter) Inasmuch as this hearing has been open to comments about the environmental impact of the proposed road and the economic development of this area and the State of Montana, I feel compelled to make a few remarks. Great Falls, Butte, Livingston and Bozeman have been heard from, so now may I add to the list, Helena. I am Al Dougherty, a practicing attorney in the capital city of Montana. It occurs to me that the importance of the highway, which is the subject of this hearing tonight, is greater than the aid or assistance to a private enterprise, as has been alleged here tonight. The development of this area as a scenic and recreational area transcends the corporate development of Big Sky. It represents a decision which must be made for all of Montana, it seems to me. Now, that decision is whether Montana is to develop its recreational potential or to wallow in its present economic morass: a lack of industry, inadequate expansion of its tax base, unemployment exceeding the national average, and growing welfare problems. The loss of thousands of its talented and skilled young people to other areas of the nation because they cannot find jobs in their native state. This is a very personal problem to me. I have three sons, ages 28, 29 and 30, two of whom have left their native state because of the lack of opportunity here. The Big Sky, however, represents a ray of hope for the Treasure State's recreational development, it seems to me. It means, hopefully, an increased tax base for Gallatin and Madison Counties, an impressive new source for state revenue purposes, if our newly proposed constitution should be approved, another source of employment year around for the Montana labor force and a well-spring of business revenue throughout the state from visitors who will unquestionably visit a ski and recreational center. Thus, it seems manifest to me, the building of the proposed highway and the completion of the Big Sky have more than an ephemeral interest to all of Montana, and to Western Montana in particular. The development will be an economic boon to Bozeman, Butte, Helena, Great Falls, Livingston; all of Montana. Mr. Chairman, I am as interested in ecology as any person who is in this room tonight. I was counsel for a rancher, who in 1962 brought legal action against the Rocky Mountain Phosphate Company in Garrison, Montana for fluoride damage in the Garrison area. As an advertisement, I might say that I prevailed in that case. (Laughter) I struggled with it, however, for four long years prior to its culmination in a jury trial, which was held in your Gallatin County Courthouse and lasted two weeks. I do not doubt the personal sincerity of those environmentally-oriented persons who appear here and, in effect ask you, our state and federal governments, to slow and perhaps even to stop the Big Sky development. I will assume that they are concerned, as I am concerned, about possible environmental

damage which might result from the commencement of any new business in the state, industrial or recreational. I do, however, question their wisdom in following a course of adamant opposition to the Big Sky development. I suggest that reason and justice, and equity and foresight require us, and those who will render judgement based upon what is in this record tonight, to consider these approaches to the problems of all of us here. First, the earth must be protected as living space for man, other animals and other living things. Second, mankind must use that living space so that minimal environmental damage results from his use of the planet. Thirdly, orderly and intelligent development of land can be achieved if private enterprise and government cooperate. Fourth, Montana, distant from the merchandising markets of this nation, has long dreamed of capitalizing on its recreational potential. Fifth, there is, in my opinion, room in Montana for recreational development, with the minimal environmental damage I mentioned, and Big Sky appears to me to have approached its goal with environmental protection in mind. Sixth, Montana does need the Big Sky, as it needs Big Mountain and other developments and, in my opinion, it therefore needs the highway, which is the subject of this hearing tonight. I respectfully suggest to you, and through you to your superiors, Mr. Chairman, that reasonable men and women, shouldered with the responsibility for both the economic development and the environmental protection of this state, this nation and this world can, if they so desire, and if they act in good faith, build this highway with minimal environmental damage and resulting good to all of Montana. I thank you very much.

ANDERSON: Thank you, sir, for your remarks. (Applause) Any further remarks relative to the highway location? Yes, sir, the microphone right there.

PARSON: I'd rather come up in front if I could.

ANDERSON: Come up to the front microphone, yes. You can take that microphone off the stand there, yes.

PARSON: My name is Bill Parson, and since I thought this meeting tonight was going to be to discuss the alternates, I spent the majority of the day in the West Fork walking the alternates and looking them over and I'd like to offer for the record my opinion of what the best alternate would be.

ANDERSON: Very good.

PARSON: Incidentally, the score is fourteen to fourteen right now, for and against. The Forest Service engineer, Ken Gallic, and a representative, Nick Finzer, from the Squaw Creek District, and I spent considerable time up there on the West Fork today looking at all the alternates and what we came up with - at least I came up with. . . I won't commit Ken or Nick. What I feel is

is the best alternate is a compromise between Alternates A . . . excuse me, B and C, and it would traverse the Middle Fork, south slope of the Middle Fork drainage, in about this manner. I'll try and stay out of the way so I can show you. It starts here, in about this general vicinity, and then ties back in about here. The reason I prefer that route over the existing Route B is, on Route B they cross a large draw in this vicinity, about a 30-foot fill; another . . . I think about a 30-foot fill in this draw, and then another fill up across this draw here. Alternate C has a 45-foot cut through this area of sagebrush - which you can imagine what that would look like - and a 60-foot fill across here. The alternate that I prefer would have about a 20-foot fill through this vicinity and no other cuts or fills of any significant proportion to the point joining the red line to the end. Thank you.

ANDERSON: Thank you. (Applause) If you would bear with us a moment, there's a few that would like to get up and leave. They've been sitting on these benches for quite awhile. There's more people that want to testify. We will accept further testimony now on the location of the highway. Does someone have a remark? Please take that microphone over there.

DORSEY: I'm Jeff Dorsey from Gallatin Gateway, and I came with the impression an alignment for the Big Sky has been established and so the question has not been brought out to you state men. What is the cost of the road to the best alignment? And build the road and build it economically and help Big Sky to develop this part of the country which needs work and which needs taxpayers. I thank you.

ANDERSON: Thank you. (Applause) Go ahead.

RAYMOND. I'm Clark Raymond of Madison County. I'm County Commissioner over there, and Madison County does have an alternate preference. Our preference is whichever road the Highway Department determines is the best one. In my judgement, there's only been two statements of substance, of consequence with relation to the corridor, one by Mr. Goetz and one by my friend, Ben Stein, and I think their quarrel is with John Volpe, the Secretary to the Department of Transportation. They evidently think he needs education. Let them take their criticisms to him. Thank you.

ANDERSON: Thank you. The gentleman here in the front now had a question. Yes, sir.

WORTMAN: I have to find out how to operate this thing.

ANDERSON: Speak right into the end of it there.

WORTMAN: My name is Norm Wortman. I've live in this canyon here for twenty-four years, and I'm also Chairman of the Ophir School. I

came here tonight to listen to some proposals for a road right of way. I've listened to campaigns, I've listened to people tell all sorts of stories, and very little about the proposed road and the proposed right of way. I rather doubt that there's too many people in here that are engineer enough to get up and state where it should go, or where it should not go. I'm quite familiar with the entire area here. About the only comment that I have now is that, let's keep it to the road right of way; keep the questions directed and the answers directed to this proposal. Thank you. (Applause)

ANDERSON: Thank you. Yes, sir. Way in the back there.

MYERS: I'm Walt Myers from Virginia City. I'm Chairman of the Overall Economical Development Plan for Madison County. We have a forty-member committee and they voted one-hundred percent in favor of this road. I believe that they will leave it up to the State Highway Commission of which route's the best to take. For those who are fearful of what roads may do to the country, I would like to give a comparison. In 1920-1921, while working for the Forest Service in charge of trail construction in the Bitterroot, we felt the same as those in opposition to this at that time, that the road through from Rock Creek through the mountains over to the Bitterroot Valley would do much damage. Fifty years later, last summer, I had the opportunity to visit that same area at which I was working, the beautiful Burnt Fork Lake, Stoney Lake, Frog Pond Basin, and it's just the same today as it was then, with the exception there - they did a little logging in there that was not done at that time, so it's not going to do any more damage here than it did over there. Thank you.

ANDERSON: Thank you. Next? Would you step up to the microphone, sir.

CORRIGAN. My name is Buck Corrigan. I'm a citizen of this state and this county and I live here in Gallatin Canyon. My concern with this proposed road project is not so much where within this quarter-mile strip the road will be built - I think that should be left up to the engineers. What I am concerned with is the fact that this road is going to be funded by taxpayers, fourteen percent by the State of Montana and eighty-six percent by federal funds. That means that native Montanans get hit twice, so I think before we spend the money on this road, we should look at the roads in the state that need federal money, federal funds and state monies, and also, we should look at the fact that the environmental impact study, the socioeconomic impact studies that have been done, or are being done, are not complete. They haven't been finished yet. This meeting is being called to get a public opinion of the people in the State of Montana, in the county, and in our own small area here in Gallatin Canyon, to voice an opinion as to whether or not this road should be funded by state and federal funds. However, there are a number of organizations that are concerned with the way this road is going

to be built and where it's going to be built, that have not yet voiced their opinions so that you can make a decision. I don't believe that I am educated enough or well-informed enough to make an opinion on the overall impact of this road, which the state hopes will eventually go through to Ennis. I think that I should have a chance as a taxpayer to listen to the private organizations, some of them very well-intentioned people. I think I should have a chance to listen to what they have to say about this impact study and, at this point, our opinion may be very important to the eventual building of this road with state and federal funds, and the other projects involved; the other people involved. The other agencies have not voiced an opinion as yet. I'm being asked to make an opinion without the facts available. All I want available to me as a taxpayer and a citizen is the impact study done by the state government and, frankly, I'm afraid of the government. I'm not sure if I can trust them or not and I would like to have the opinions of other concerned individuals, so I'd like to say to the group here - this meeting should be postponed until we find out from other individuals exactly what's going to happen. The road will be built. Big Sky is going to be a recreation area; it is a recreation area. I'm a skier and an outdoorsman and I want access to the federal and state lands around it and I want access to the ski area when it's built, but I'm not sure that I want to pay fourteen percent as a state taxpayer, and I'm not sure that I want to help with the eighty-six percent as a federal taxpayer to build this road when it could have an adverse affect on the state and federal lands surrounding it. I think we should get the opinions of the other concerned individuals and groups before we go ahead and make a decision as the public in the State of Montana as to whether or not we're going to finance this road. Thank you. (Applause)

DON ANDERSON: Thank you. Way in the back there, can you move up to the microphone?

BOB ANDERSON: My name is Bob Anderson. I live in Bozeman. I'm a party to the Coalition that Mr. Haglund represented earlier and I came here tonight to give a detailed criticism of the Environmental Impact Statement, and by the Environmental Impact Statement, I mean the gray document that was prepared by the Montana State Highway Department. This environmental statement was criticized in a statement by Miss Dorothy Bradley. Now, she covered most of the points that I intended to mention so I won't reiterate any of those, but I will defend her criticism of this by Dr. Wright. Now, the material that Dr. Wright brought with him is indeed, I think, a good, thorough analysis but it is not included in this report. This report has four double-spaced typed pages of environmental impact, and it has four double-spaced typed pages of verbatim material from the proposals that Dr. Wright has with him. Now, had that material been made available and included in this document I'm sure it would have been a meaningful

document but, as it is, I concur with Miss Bradley; it's a shallow, project-serving document and a much more thorough job must be done by the Highway Department and the Federal Highway Administration before the public can have the benefit of that analysis. Thank you.

SKOOG: I might mention one point here. I am not sure that it has been made clear that this environmental statement that you mentioned is a Draft Environmental Statement. The regulations under which we operate require us to prepare a draft statement and circulate it to various state, federal and private agencies for their comments, and at such time as we have received the comments from these agencies and the comments of the general public at a public hearing, then we publish what is called a Final Environmental Statement and both of these statements are filed through the Federal Highway Administration to the President's Council on Environmental Quality in Washington.

ANDERSON: Any further comments relative to the highway? Yes, sir. The microphone over there.

CULVER: My name is Frank Culver. I'm from Bozeman and I'd like to give my personal testimony tonight. It's very brief but I think it's very appropriate for this meeting. What it consists of is a one-sentence quote by Aldo Leopold and I would like to quote this into the record. "Recreational development is a job, not of building roads into lovely country but of building receptivity into the still and lovely human mind" and I think there's a lot of this educational process that could go on in this room. Thank you.

ANDERSON: Thank you. I might mention at this point that all of the information that we have available here tonight is available in Bozeman, for those of you in this area. I'm sure a phone call to Mr. Dennis Williams will keep you up-to-date on the progress of this project. Any further comments? Would you get up to the microphone, please.

SIEVERS: I'm Bruce Sievers. Just one quick informational question. How many people presently live at the end of this proposed road, in this area?

SKOOG: In the area of the end of the road there is no permanent residence there now.

SIEVERS: Thank you.

ANDERSON: Yes, sir.

FISHER: I'm Homer Fisher. I asked the question sometime ago about the proposed road by the Highway Department to the alternate route, or whatever route they take. Is it going to be damaging to the

recreational area, where they've got to move and be a big expense to them, or the highway's got to be moved and be a big expense to them, or are they going to work together and try to get the best route to suit both projects? Thank you.

SKOOG: I think we've tried to coordinate our efforts in locating this highway with a number of people, including Big Sky, because they are definitely a factor that has to be taken into consideration. We have also coordinated our efforts and been out on field reviews with Forest Service and Fish and Game people, and we will continue to do this in the development of the project.

ANDERSON: Yes, sir, this gentleman up in front here.

STEVENS: My name is Bob Stevens. I am practically born an environmentalist. My father-in-law is the late Louie Bromfield so I know something about it. I'm also a businessman and I'm amazed that the environmental people have failed to mention one thing this evening and that is, they say that the whole study should be taken as the impact on the whole area, all factors being considered. No one has mentioned Yellowstone National Park, nor the wilderness survey, nor the study which the park has gone through for the future use of that park, as far as traffic and the handling of people is concerned. I think that this is relative to this road project because as the facilities for staying in Yellowstone Park diminish, as they most certainly will, there are going to have to be facilities outside the park, yet within near enough range of the park that people may stay and see Yellowstone Park. It is a fact that this project, whether it was designed for that or not - I'm referring to the Big Sky project - will serve an important function in helping to house the people who will see Yellowstone Park in the years ahead. Thank you.

ANDERSON: Thank you. Yes, sir.

OCHENSKY: I think that perhaps a lot of people that came here tonight have forgotten that Americans are more or less mobilized today. They have motorcycles, they have snowmobiles. They don't hardly walk anywhere. When it comes to staying in Yellowstone Park, there's a lot of room for those who'd like to walk and camp under a pine tree. There isn't enough room to pull into a paved parking lot with your house trailer. No! You people are proposing that we put through a nice road, all the way through, so more Americans can drive through this country and might I remind you, that when visitors come to a state, they're exactly that; they are visitors. They don't reappear and they don't have to look at the garbage they leave, and if any of you don't believe it, walk up the sides of the roads that run right out there next to the Gallatin and try and get away from the sounds of the semi's at night. Go up the sides of the hill and hear how the canyon acts like a megaphone. You may say "this is our environment," you may say "we need the revenue" but I'll ask you this, 'do you need the peace

of mind?' Michigan used to be like Montana. It isn't any more. I had to leave Michigan. It's criss-crossed with roads so people don't have to walk anywhere, and now there's nowhere left for them to walk.

ANDERSON: Could we have your name, please? Give us your name for the record.

OCHENSKY: George Ochensky.

ANDERSON: Thank you.

GRANT: I'm Harry Grant, Executive Director of the Inter-County Development Corporation of Southwestern Montana. The Inter-County Development Corporation of Southwestern Montana is a nonprofit corporation attempting to assist the twelve counties that compose the district to achieve economic development. The twelve counties within the district are Beaverhead, Broadwater, Deer Lodge, Gallatin, Granite, Jefferson, Madison, Meagher, Park, Powell, Ravalli and Silver Bow. You've heard from quite a number of those counties. I have a study in my hand that was prepared by the Inter-County Development Corporation of Montana. I'd like to read just a few excerpts to you. I think some of these statistics, most of which were taken from the 1970 census, might surprise you. From 1960 to 1970, the twelve county district that I just named for you, had an outmigration in the 18 to 34 age group of 29.5%. That's 11,828 persons, age 18 to 34, who migrated out of the district and were not replaced. That's 67%, almost 68%, of a net loss in population of 17,454. Now, we talked a little bit about taxes. I'd like to read you some information on taxes, and this comes from the Biennial Report, Montana State Board of Equalization, and these figures are available to anybody that wants to go and check them. Taxable property value and property taxes, 1960 to 1970: Within our twelve county district, total taxable property value in 1960 was \$129,765,000. By 1970 it had increased to \$179,587,000, an increase of almost 40%; 39.4%, but let's see what we were doing in the way of paying taxes. Total property taxes levied within our district in 1960 amounted to \$17,583,000. By 1970 it had increased to \$35,252,000, or a 100% increase. Now, within our twelve county district, six counties are designated as redevelopment areas. We have two more counties that have been notified they are eligible for designation. I'd like to read off the counties in our district that are designated, or have been notified they are eligible. There's Deer Lodge County that is designated; Granite County that is designated; Jefferson County that is eligible for designation; Madison County, the county right over there, that is designated; Meagher County that is designated; Park County that is designated; Ravalli County that is eligible for designation, and Silver Bow County that is designated. These designations are based on unemployment within the county. In most cases, the unemployment rate exceeds 50% above the national average. We've got a problem within our district. We've got a problem in Montana. Personally speaking, as a citizen of Montana and Southwestern Montana, I'd like to thank

Chet Huntly and Gus Raaum and Big Sky for coming, first, to Montana, but I'd especially like to thank them for coming to Southwest Montana.

ANDERSON: Thank you. I believe we've fairly well discussed the project and several other projects within the area. I'm sure that you will all be kept informed on the progress of this project. Is there any statement from the Federal Highway Administration?

STEWART: Harold Stewart, Division Engineer, State of Montana. I'd only like to state that on the economic designation as an Economic Growth Center, the committee that made the designation was composed of the Department of Transportation, EDA - Economic Development Agency, as is required by the law and other agencies. I do not know specifically if the Forest Service was included. I know there were other agencies involved. As far as the project under discussion, the rules we are presently following, the Highway Department and Federal Highway Administration are following all our rules as laid out in PPM 20-8, which is the public hearing requirements, and PPM 90-1, which is the environmental statement required.

ANDERSON: Thank you. Any further statements from the Highway Department?

BECKERT: This is Jack Beckert. I would like to thank everybody that spoke and everybody that attended tonight. We certainly obtained a lot of useful information and we will certainly keep you all informed. Thank you again. Good night.

ANDERSON: Thank you.



LEGEND

PROJECT F-20(1)
U. S. 191 SPUR

ALTERNATE NO. A

ALTERNATE NO. B

ALTERNATE NO. C

ALTERNATE NO. D

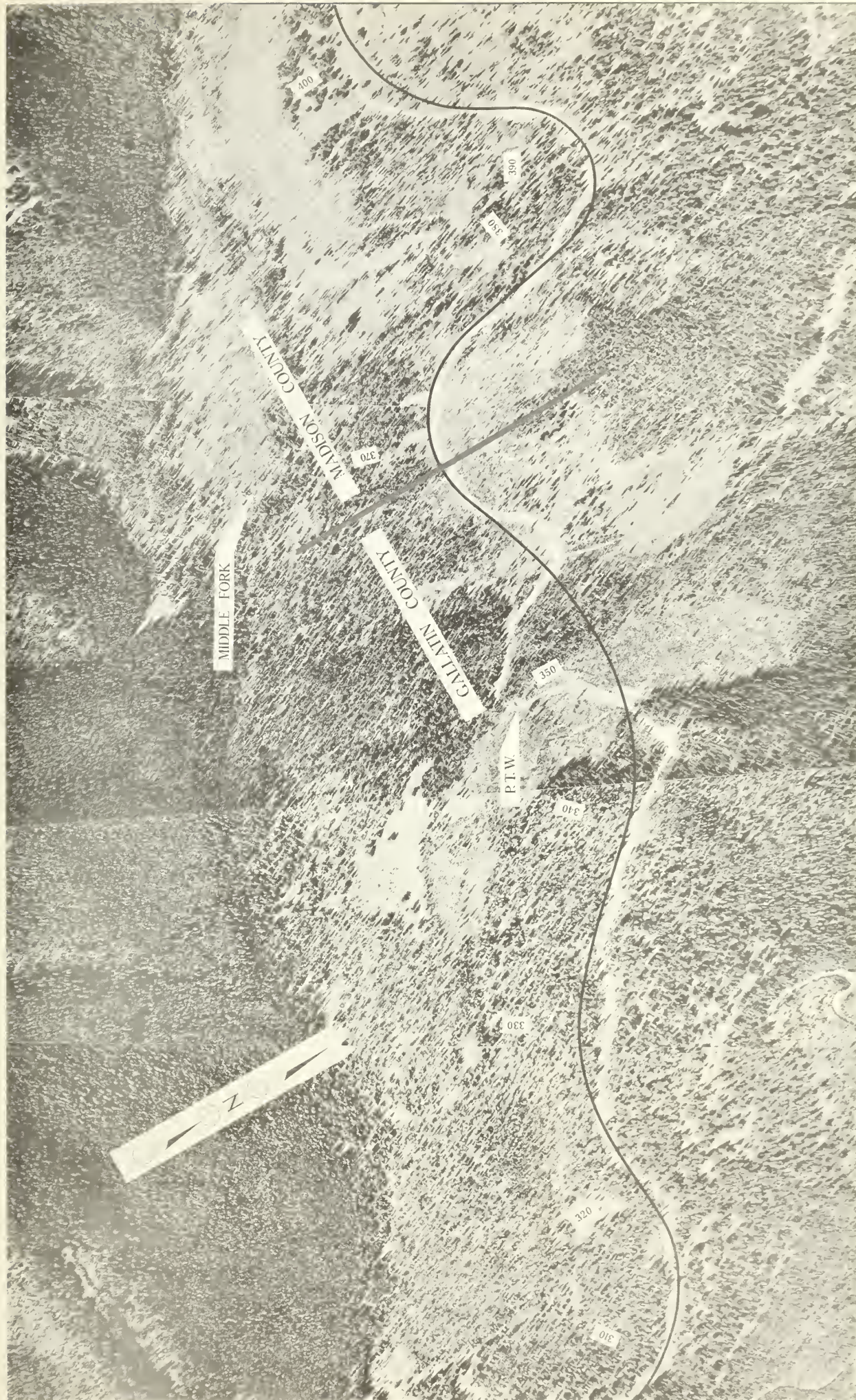
ALTERNATE NO. E

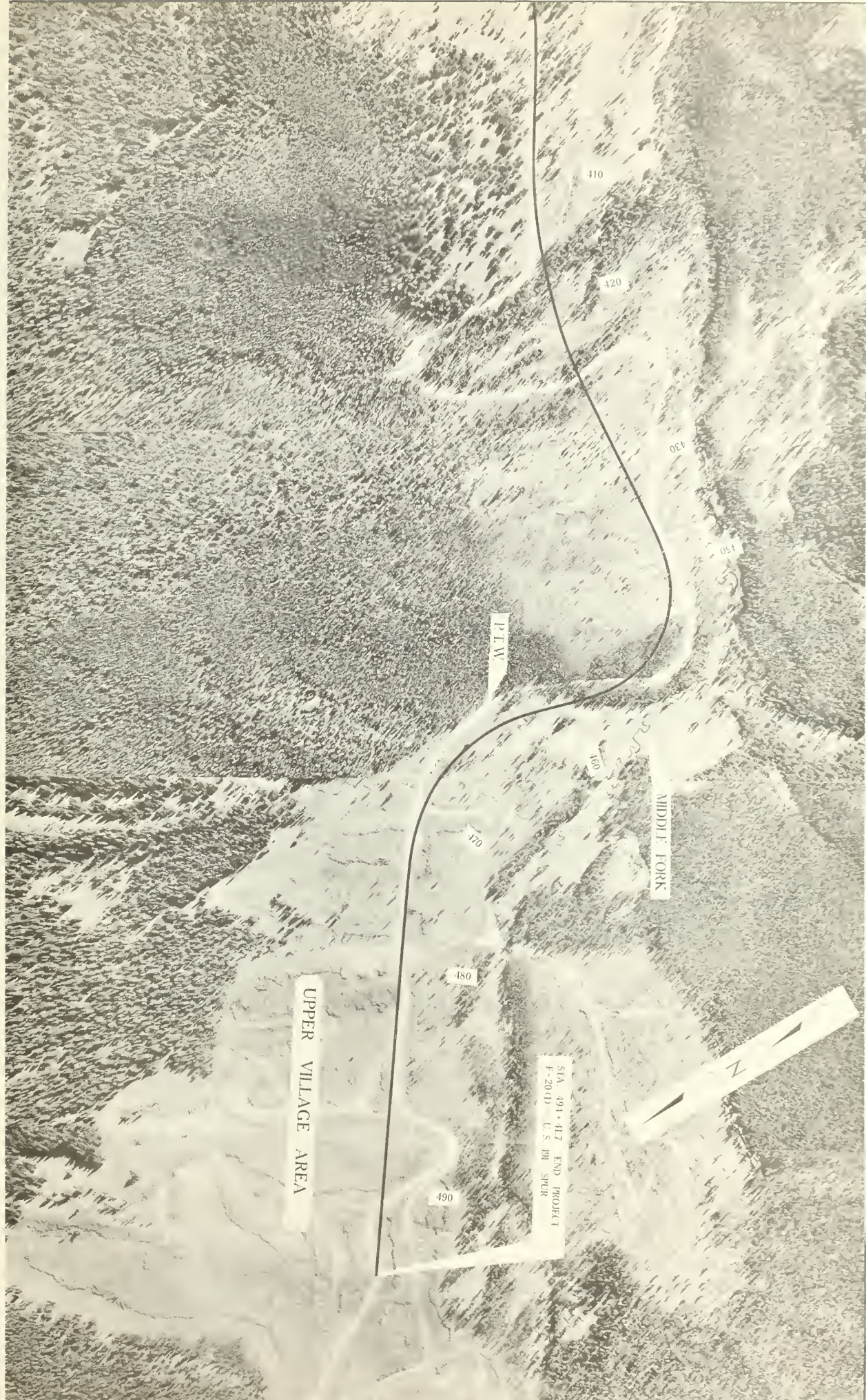
NEW CONST. (EXISTING)

SCALE









UPPER VILLAGE AREA

MIDDLE FORK

P.W.

STA. 491 + 417 END PROJECT
F-20 (D) U.S. 101 SPUR

N

490

450

470

460

450

430

420

410

CORRIDOR PUBLIC HEARING--ROUTE 191 "SPUR", CONNECTING THE
BASE OF LONE MOUNTAIN WITH ROUTE 191 ---Karst Camp, Montana

Statement of James H. Goetz

My name is James H. Goetz. I am a native of Ennis, Montana. I currently live in Bridger Canyon, Bozeman, Montana, and I drive on gravel roads to and from work every day.

It is my position that the use of substantial sums of public money to build an access road for a private speculative land development is bad policy. It is my further belief that many of the acts of the Montana Highway Commission and the Federal Highway Administration in their attempt to finance the road between Route 191 and Lone Mountain are inconsistent with federal law.

Section 101(a) of the National Environmental Policy Act, 42 U.S.C.A. sec. 4331 (a) declares that,

It is the continuing policy of the Federal Government... to use all practicable means and measures...in a manner calculated to foster and promote the general welfare, to create and maintain conditions under which man and nature can exist in productive harmony, and fulfill the social, economic, and other requirements of present and future generations of Americans.

In pursuit of that goal, sec. 102 (2) (c) NEPA provides:

Sec. 102. The Congress authorizes and directs that, to the fullest extent possible:...(2) all agencies of the Federal Government shall-

(C) include in every recommendation or report on proposals for legislation and other major Federal actions significantly affecting the quality of

the human environment, a detailed statement by the responsible official on--
(i) the environmental impact of the proposed action,
(ii) any adverse environmental effects which cannot be avoided should the proposal be implemented,
(iii) alternatives to the proposed action,
(iv) the relationship between local short-term uses of man's environment and the maintenance and enhancement of long-term productivity, and
(v) any irreversible and irretrievable commitments of resources which would be involved in the proposed action should it be implemented.

Prior to making any detailed statement, the responsible Federal official shall consult with and obtain the comments of any Federal agency which has jurisdiction by law or special expertise with respect to any environmental impact involved. Copies of such statement and the comments and views of the appropriate Federal, State, and local agencies which are authorized to develop and enforce environmental standards, shall be made available to the President, the Council on Environmental Quality and to the public as provided by section 552 of title 5, United States Code, and shall accompany the proposal through the existing agency review process.

In the present case, the Federal Highway Administration has not undertaken a draft of the environmental impact statement required by Sec. 102(C) of the National Environmental Policy Act (NEPA) even though it is obvious that the proposed Route 191 "spur" is a major federal action significantly affecting the environment, and even though the NEPA requires that the impact statement "shall accompany the proposal through the existing agency review process".

Apparently the FHWA is relying on the environmental impact statement prepared on the Route 191 "spur" by the Montana Highway Commission (dated Feb. 16, 1972, approved by Harold N. Stewart, FHWA Division Engineer, Feb. 9, 1972).

Presumably this reliance is based on FHWA Policy and Procedure Memorandum (PPM) 90-1, "Guidelines for Implementing section 102(2)(C) of the National Environmental Policy Act of 1969...". Sec. 6(b) of PPM 90-1, provides that "Draft environmental statements, when required,... shall be prepared by the HA...and circulated for comment during the location study...". The "HA" is defined in Sec. 3(e) as: "...the agency with the primary responsibility for initiating and carrying forward the planning, design, and construction of the highway. For highway funds, the HA will normally be the appropriate State highway department...".

The Federal Highway Administration regulations (PPM 90-1) purporting to implement the NEPA are invalid to the extent that they delegate the responsibility for preparation of an environmental impact statement to the applicant for the highway project (in this case, the Montana Highway Commission).

The Federal Courts have considered the question whether the Federal agencies can delegate the responsibility for compiling an environmental impact statement and have held that such function is nondelegable, Green County Planning Board v. Federal Power Commission, No. 71-1991, 2nd. Cir., Jan. 17, (1972). In the Green County case the Power Authority of the State of New York (PASNY) applied to the FPC for a license. The FPC regulations at that time delegated the responsibility for preparation of an environmental impact statement to the applicant for a license.

The Court held that the FPC must prepare an independent impact statement prior to holding hearings on the license. The Court said:

The Federal Power Commission has abdicated a significant part of its responsibility by substituting the statement of the PASNY for its own.

...The danger of this procedure, and one obvious shortcoming is the potential, if not the likelihood, that the applicant's statement will be based upon self-serving assumptions.

It is my conclusion that the lead Federal agency is obligated by Federal law to prepare the draft environmental impact statement. It is also clear that such impact statement must accompany a proposed federal action through every stage of the existing agency review process. The hearing tonight, therefore is not properly constituted because there has been no Federal impact statement prepared.

I respectfully submit that this hearing be postponed until such time as the Federal Highway Administration prepares its own environmental impact statement.

OPPOSING THE CONSTRUCTION OF "LOVE MOUNTAIN ACCESS ROAD"
WITH FEDERAL AND STATE FUNDS

If Montana were to set its own priorities in highway needs, this project would be near the bottom of the list. Within 100 mile radius of Bozeman and within this highway district we have projects stalled for lack of funds. There is one bridge across the Yellowstone River, used daily by a fair-sized community, in dangerous condition and without funds for repair. The largest and busiest ski area in Montana is served by an inadequate road sixty miles from here.

But Montana is allocated a cupfull of the federal custard-- a dish prescribed in Washington-- the same recipe spooned out for New Jersey and New Mexico and Iowa. For the Montana Growth Center project, Washington has approved a two million dollar outlay of federal and state road funds under the general pretext of reversing the trend of migration to population centers. Under any conceivable cost-benefit accrual, this is a fantastic outlay to keep a few skiers and golfers and their cooks and instructors out of the New York and Los Angeles traffic for a few days. The federal desire to alleviate the metropolitan population crunch is the reason for the program that finances the Love Mountain Access road project. And the public will pay to transfer ~~transfer~~ the roar of traffic from the big city to the big sky.

As an elected official, familiar with the needs expressed by citizens of Montana, I say we do not need fun city constructed within the Gallatin Forest at public expense.

Some Montanans with a different opinion welcome Big Sky Corp. in fostering a broader tax base. I suggest that if it is going to cost between three and four million tax dollars to assist this type of enterprise (approx. funds spent and projected for Big Sky), then we have consented to a very hazardous public policy. It would be appropriate for the State of Montana to refrain from participating in the promotion of mountain real estate, and henceforth to beware of public-spirited salesmen of subdivisions who want to broaden our tax base.

CORRIDOR PUBLIC HEARINGS STATEMENT

Members of the Montana Department of Highways staff, Ladies, and Gentlemen:

I am Brent Haglund of Gallatin Gateway, Montana. I am coordinator of the Ad Hoc Coalition of Concerned Organizations. The testimony I shall present has been approved by: Bozeman Group, Sierra Club; Absaroka Beartooth Task Force; Montana Wilderness association; National Forest Preservation Group; The Wilderness Society; Gallatin Chapter, Zero Population Growth; Democratic Coalition, and Environmental Task Force. Other groups have pledged their support.

This statement is a joint effort of a number of groups who have witnessed the erratic performance of federal agencies in implementing national environmental policy in the West Fork of the West Gallatin River over the past two years. The organizations submit this statement as part of their continuing effort to monitor administrative action to help insure that it does not contravene the policy so set forth in the National Environmental Policy Act of 1969, P.L. 91-190.

"To declare a national policy which will encourage productive and enjoyable harmony between man and his environment; to promote efforts which will prevent or eliminate damage to the environment and biosphere and stimulate the health and welfare of man; to enlist the understanding of the ecological systems and natural resources important to the nation. . ."

The Coalition appreciates the opportunity to comment on the environmental statement and the proposed routes and hopes the comments will be helpful.

COMMENTS ON:
THE DRAFT ENVIRONMENTAL STATEMENT
MONTANA DEPARTMENT OF HIGHWAYS

FOR
PROJECT F-20 (1), U.S. 191 SPUR
WEST FORK WEST GALLATIN RIVER, MONTANA
IN ACCORDANCE WITH
PUBLIC LAW 91-190, SECTION 102(2)(c)

BY
AD HOC COALITION OF CONCERNED ORGANIZATIONS

Lorent Haglund, Coordinator
Canyon Route
Gallatin Gateway, MT 59730

April 20, 1972

Introduction

This statement is a joint effort of an ad hoc Coalition of concerned organizations who have witnessed the erratic performance of federal agencies in implementing national environmental policy in the West Fork of the West Gallatin River over the past two years. The organizations submit this statement as part of their continuing effort to monitor administrative action to help insure that it does not contravene the policy so set forth in the National Environmental Policy Act of 1969, Public Law 91-190.

"To declare a national policy which will encourage productive and enjoyable harmony between man and his environment; to promote efforts which will prevent or eliminate damage to the environment and biosphere and stimulate the health and welfare of man; to enlist the understanding of the ecological systems and natural resources important to the nation...."

The Coalition appreciates the opportunity to comment on the environmental statement and hopes the comments will be helpful.

Economic Growth Area Designation and National Forest Management, 1972

The Coalition is concerned about the precedent of declaring lands within the boundaries of the National Forests as potential areas for economic growth and development. It is the Coalition's contention that such designation and the use of funds to promote the growth and development of selected and surrounding areas is in conflict with the purposes for which the National Forests were established and recent Congressional acts and the management policy for the National Forests.

National Forest Organic Legislation establishes the National Forests "... to improve and protect the forests within the boundaries, or for the purpose of securing favorable conditions of water flows, and to furnish a continuous supply of timber for the use and necessities of citizens of the United States...." (1) The Multiple-Use Sustained Yield Act passed in 1960 further defined the management policy for the National Forests: "... the National Forests are established and shall be administered for outdoor recreation, range, timber, watershed, and wildlife purposes." (2) The Multiple-Use Sustained Yield Act further states that the above stated purposes are, "... declared to be supplemental to, but not in derogation of, the purposes for which the national forests were established as set forth in section 475 of this title." (2)

Based on the above Congressional legislation, it is the judgment of this Coalition that the U.S. Department of Transportation (DOT) has subverted Congressional intent by declaring the West Fork drainage of the Gallatin River an economic growth center, making it eligible for a highway construction project under Section 127 of the Federal-Aid Highway Act of 1970. The area selected is completely within the boundaries of the Gallatin National Forest and currently contains public domain lands. (See Attachment A.) Section 143 of the Federal-Aid Highway Act states that the purpose of demonstration projects is to, "... serve and promote the development of economic growth centers and surrounding areas" (3) This objective is not in accord with the Congressional purposes for which the national forests were established and appears to be in conflict with the National Forest Organic Legislation requirement, "... to improve and protect the forests within the boundaries...." (1) The type of development taking place in the West Fork drainage can be typified by that currently taking place by the Big Sky Corporation, which is "... a land development corporation and as such will be marketing home sites and condominiums. (4:13) The DOT based its decision to approve this growth center believing that it would promote and encourage this type of land development and subsequent land use changes. The panel based its judgment on the assured existence of a first rate recreation complex initially costing \$20 million, the ownership of additional commercial lands by a large and capable potential developer (assumed to be Burlington Northern Corporation) as well as probable satellite development on commercial lands held in smaller quantities by other individuals. (5) This type of federal agency policy-making creates an open door invitation to real estate developers to use lands within the national forests, and contradicts Congressional legislation. As a result a profound impact on the character and administration of the national forest lands will take place, as indicated by the Forest Service in their analysis of the administrative impact of the Big Sky development on public lands:

The exchange will have a marked effect on administration of public lands due to the exchange and the subsequent opportunity afforded for development of the Big Sky Corporation. The Forest Service must now provide for intensive management and provide for long-range comprehensive planning to prevent deterioration of the environment.(6:5) The exchanges and subsequent development of Big Sky will have an impact on other public land, including the Spanish Peaks Wilderness, by introducing large numbers of people into the area. The Forest Service will be forced to intensify management and control and to put into operation comprehensive planning for the entire Gallatin Canyon area.(6:3)

The Coalition therefore requests that the growth center designation decision be reversed.

Compliance of Big Sky as an Economic Growth Center with Sec. 143 (a) of Chapter 1 of Title 23, United States Code (P. L. 91-605).

Section 143 of P. L. 91-605 (also cited as the Federal-Aid Highway Act of 1970) provides for the designation of economic growth center development highways. Subsection (a) was established in order to demonstrate the role that highways can play:

to promote the desirable development of the Nation's natural resources, to revitalize and diversify the economy of rural areas and smaller communities, to enhance and disperse industrial growth, to encourage more balanced population patterns, to check, and, where possible, to reverse current migratory trends from rural areas and smaller communities, and to improve living conditions and the quality of the environment. (Emphasis added.) Under this section the Secretary of Transportation is authorized to make grants to States for demonstration projects for the construction, reconstruction, and improvement of development highways on the Federal-Aid primary system to serve and promote the development of economic growth centers and surrounding areas, encourage location of business and industry in rural areas... provide rural citizens with improved highways to such public and private services as health care, recreation, employment, education, cultural activities, etc. The Governors are to recommend prospective growth centers within their states, but before designating an economic growth center, the Secretary of Transportation is to consult with the Secretary of Commerce and determine that the growth center (1) is geographically and economically capable of contributing significantly to the development of the area, and (2) does not have more than 100,000 population. While these two restrictions are mandatory the Secretary is not necessarily limited to them.(16)

Big Sky, Inc. hardly qualifies under the objectives of this act. Though it does offer growth through natural resource development, i.e., recreation, it is a private real estate development program. Prior to the development by Big Sky the permanent year-around population of West Fork was three persons. With its projected population, Big Sky is, in reality, the creation of a new recreation town and probably ineligible for designation as an economic

growth center. In Attachment B of the Secretary of Transportation's Criteria for Selection and Approval of Growth Center Highways, under subsection (13) of Section 3 "Administrative Criteria for Economic Growth Center Selection," it states very clearly that "new towns which are satellite or bedroom communities of metropolitan areas are not the type of communities to which this legislation is directed." Big Sky is certainly a second home project (1200 condominium apartments and 300 detached homesites) and would be even more questionable in meeting the criteria than a bedroom community, for a majority of occupants would live there on a temporary basis and continue to permanently live and work at an urban location. They would only live there on a temporary basis when their favorite sport or form of recreation was in season. Second homes do not relieve urban congestion; actually they diminish the land base for production of essential goods and services and place additional demands on finite resources needed for primary homes in other areas.

Two other requirements that a proposed economic growth center should meet are: (1) it should provide employment and residence opportunity to the surrounding area, and (2) be growing faster than the rest of the community.

Upon its completion Big Sky will employ approximately 300 persons. However, the work is seasonal and of the type that is usually low paying, e.g., waitresses, chambermaids, caretakers, instructors, etc. It is also doubtful that many of these employees will be employed on a permanent or year-around basis. What is more likely is employment on a rush-season basis. This employment is also not likely to be viable in the future.

There is no doubt that Big Sky is growing, and presently it may be growing faster than the rest of the "community". It could do nothing but grow when all that previously occupied the area were a few ranch buildings and summer homes. This also raises the question of what is the rest of the community? If Bozeman is included as part of the community, Big Sky cannot compete with it for continued growth. Since Bozeman is presently the fastest growing area in Montana (in both population and economic development) it would be more appropriate that it be designated an economic growth area. A greater number of local people would benefit by such an action. Several other areas concurrently entitled as economic growth areas with Big Sky were municipal areas. In Colorado these were: Durango, Steamboat Springs-Craig, and Camasien-Montrose, and Casper in Wyoming.

In addition, in Attachment C of Criteria for Selection, the definitions listed seem to be geared for municipal areas which serve surrounding trade areas rather than private development. For example, the definition of Economic Growth Center states that "such growth centers could include a central city or town...or a number of important communities...linked by major transportation facilities." The definition of geographically dispersed "implies that an area designated as a growth area must be within sufficient radius and target areas to afford residents of these areas commuting opportunities with reasonable convenience to employment and services available in the growth center...." (Emphasis added.) In summary, the definition allows that the West Fork area and its related developments does not meet criteria set forth by Congress and DOT. Therefore we ask for more justification and documentation before we will be satisfied that the area might qualify.

Compliance of "Lone Mountain Access Road" with Instructional Memorandum 50-6-71

Instructional Memorandum 50-6-71 PP 10 on the Selection of Economic Growth Centers and Development Highway Demonstration Projects, Subsection (3) of Section B, "Administrative Criteria...", states the Governor should "submit his rationale for these priorities (economic growth areas) accompanied by relevant economic and social data. Such data should illustrate the present condition of the center and target areas, major impediments to development; present intermodal transportation facilities and their linkages to growth center markets, the rural hinterland, and the overall transportation connections." (Emphasis added.)

However, the Montana Highway Commission had prepared an application for Big Sky as an economic growth area ("Lone Mountain Access Road") in June of 1971. This application is an attempt to make the project appear that it will benefit many local citizens, but it does not adequately fulfill the responsibilities placed upon the Governor by the memorandum. For example, only the combined population of Gallatin and Madison counties, i.e., 37,519 is mentioned. The actual permanent population of West Fork (3 persons), or that of Gallatin Canyon, prior to Big Sky is not stated.

The application also predicts that this project will "stabilize occupational patterns." What is exactly meant by this is not clear, but the type and effect of the employment at Big Sky has already been discussed herein. Another prediction of the application is that the development at Big Sky will attract people from urban centers. This is true, but the temporary status of such persons fails to meet one of the primary objectives of Section 143, i.e., "to check, and, where possible, to reverse current migratory trends from rural areas..." Another point not considered is that the Economic Development Agency turned down Montana's request for a \$600,000 grant to aid in development of a highway from Federal Highway 191 to Big Sky prior to the latter's designation as an economic growth area.

Failure of the Department of Transportation to Prepare an Environmental Statement For the Designation of the West Fork Drainage of the Gallatin River as an Economic Growth Center

The Coalition believes that the Secretary of Transportation's approval of the West Fork area as an economic growth center requires an environmental statement as provided under section 102(2)(c) of the National Environmental Policy Act of 1969 (NEPA) and that the Secretary's decision not to prepare an environmental statement is in violation of this Act and DOT's agency guidelines for the preparation of such environmental statements. This Act states as its major purpose:

To declare a national policy which will encourage productive and enjoyable harmony between man and his environment; to promote efforts which will prevent or eliminate damage to the environment and biosphere and stimulate the health and welfare of man....(11)

Section 101(a) of the Act states the national environmental policy:

The Congress, recognizing the profound impact of man's activity on...the components of the national environment,... declare that it is the continuing policy of the Federal Government, in cooperation with State and local governments,... to use all practicable means and measures...in a manner calculated to foster and promote the general welfare, to create and maintain conditions under which man and nature can exist in productive harmony, and fulfill the social, economic, and other requirements of present and future generations of Americans.' (11)

Section 102 states:

The Congress authorized and directs that, to the fullest extent possible: (1) the policies, regulations, and public laws of the United States shall be interpreted and administered in accordance with the policies set forth in this Act, and (2) all agencies of the Federal Government shall... (c) include in every recommendation or report on proposals for legislation and other major Federal actions significantly affecting the environment, a detailed statement by the responsible official on--

- (i) the environmental impact of the proposed action,
- (ii) any adverse environmental effects which cannot be avoided should the proposal be implemented,
- (iii) alternatives to the proposed action,
- (iv) the relationship between short-term uses of man's environment and the maintenance and enhancement of long-term productivity, and
- (v) any irreversible and irretrievable commitments of resources which would be involved in the proposed action should it be implemented. (11)

The Department of Transportation claims that the designation of economic growth areas is an administrative action that does not require a 102(2)(c) statement. However, if such an action would cause future actions which would "significantly affect" the environment, then a 102(2)(c) statement is required.

Furthermore, Congress directs that, "to the fullest extent possible," the policies of NEPA shall be implemented by Federal officials and agencies. This phrase does not give Federal officials and agencies discretionary leeway in complying with the duties imposed by this Act. The legislative history of the Act clearly indicates that this phrase was inserted to require agencies to implement the national environmental policy unless precluded by statute from doing so. (12)

The phrase is also explicitly mentioned in the Council on Environmental Quality (CEQ); Statements on Proposed Federal Actions Affecting the Environment; Interim Guidelines, April 30, 1970. In section 4, it states "the phrase 'to the fullest extent possible' in section 102(2)(c) is meant to make clear that each agency of the Federal Government shall comply with the requirement unless existing law applicable to the agencies' operations expressly prohibits or makes compliance impossible." (13)

Also, since conflicts between values must be identified before NEPA can be applied, Federal officials must consider whether adverse environmental impact will result before making any decision which affects the environment. (12) Therefore, DOT is bound by the mandates of NEPA and must make a 102(2)(c) statement when designating economic growth areas, when that action or future actions will affect the environment.

The Coalition believes that the Secretary of Transportation's decision not to provide an environmental statement with the recommendation approving the West Fork area as an economic growth center is a violation of NEPA, the President's Council on Environmental Quality's Statements on Proposed Federal Action Affecting the Environment, and DOT's own guidelines for the preparation of environmental statements.

The inadequate reason given by the DOT for not preparing a statement is,

... a demonstration project is not an administrative action requiring an environmental statement... but DOT asserted... in any event, before construction on a federal-aid highway project can be commenced, an environmental impact statement will be required on all sections having a significant impact on the environment. (7)

Unfortunately because of this narrow DOT interpretation, the public's participation in an important land use planning decision has been relegated to an after-the-fact role. DOT officials have excluded citizen participation in DOT's planning process that approved the selection of the West Fork area as a federal primary spur route (DOT approved August 20, 1971) and as an economic growth center (DOT approved November 2, 1971). Citizen participation is now solicited -- late in the planning process -- for a public hearing on the location of the proposed highway. The important decision that the road is needed and wanted has already been made by federal officials without public input, while the public is merely asked for input as to the preferred location within a predetermined corridor.

The environmental, social, and economic impacts of a demonstration highway project go far beyond the construction of a roadway. For example, the West Fork area is undergoing a land use change from ranching and timber harvesting and limited recreation to recreation development and the project will provide a stimulus to this growth. (8:8) Indeed economic growth center areas are selected on the "evidence of potential viability." (9:3) Therefore this Coalition insists that the impacts of DOT's decision to promote economic growth within the West Fork drainage of the Gallatin National Forest be analyzed in accord with section 102(2)(c) of the National Environmental Policy Act (NEPA).

An examination of section 7(b) of DOT's Implementation Procedures for Section 102(2)(c) of NEPA provides that:

Each application for a grant, loan, permit or other DOT approval... will be required to submit, together with the original application, either a draft 102(2)(c) statement or statement of negative declaration, as appropriate. (14)

To our knowledge, DOT's officials did not file their application of June 1971 to have the project of the highway Drainage approved as an economic growth activity by the DOT. DOT believes that either an environmental statement or declaration of impact pertinent to the DOT's economic growth activity designation as a primary source of revenue should have been provided the public, and if documents are provided, their declaration of impact, project description, related findings, promises, and now in accord with agency policy and law and therefore unlawful.

Failure to Consider the Entire Corridor

A question that is raised and considered by DOT officials in 102(2)(c) statement and subsequent corridor hearing is whether the entire proposed highway from U.S. Highway 191 to U.S. Highway 287 is considered only a 9.7 mile segment of a proposed highway with possibility of extending the highway to U.S. Highway 287 near Fort Collins, CO. DOT believes that because the draft statement is only a 9.7 mile segment it is incomplete and therefore an environmental statement cannot be completed on the whole project since any other construction can be anticipated on any segment of the corridor. DOT believes in the DOT's internal guidelines, sec. 5(a) states:

The statutory clause 'major federal actions significantly affecting the quality of the human environment' is to be considered by agencies with a view to the overall, cumulative impact of such actions proposed (and of other actions contemplated). Such actions may be localized in their impact, but if there is potential for the environment may be significantly affected, the statement is to be prepared. Proposed actions and environmental impact of which it is likely to be highly controversial should be covered in all cases. (13)

DOT believes that a 102(2)(c) statement must be prepared for the entire corridor before projects can be considered on the segment.

The Department of Transportation apparently lacks any authority to approve DOT's Commission's proposal of a primary source of revenue highway 191 through to Highway 287. This approval was given by the Secretary of the DOT's Highway Commission of report on June 15, 1971. The minutes of the meeting reveal the DOT's Highway Commission

reads a primary DOT's primary highway route design from Highway 191 to Highway 287. This route is approved by Big Sky of Montana, and, possibly necessary of a DOT's Highway Commission through that project designated as a primary source of revenue. (14)

Environmental is defined 501-71 pp 15 on the Environmental Impact Statement, dated on page 1 and

where construction is a new location, or extensive relocation of an existing highway is involved, the engineering and economic studies will consider the project corridor within which the project is to be located. (9) (emphasis added.)

The Department of Transportation is bound by both its own policies and the mandate of the CEQ Interim Guidelines that future actions be considered when designating an economic growth area. A 100-mile study must be done on the entire corridor before piecemeal environmental means are prepared and public hearings held on the individual project.

The proposed project is subject to both the Federal-Aid Highway Act of 1970 and the National Environmental Policy Act of 1969. The DOT officials and agencies involved in this project are duty bound to follow the procedures required by those statutes. This means that they will reconsider and rectify previous decisions concerning the project.

Draft Environmental Statement

The "Draft Environmental Statement" for project F-20(1) was prepared by the State of Montana Department of Highways. Due to the limited scope of the report and ignoring numerous oversights, faulty assumptions and unsubstantiated opinions, it may be criticized on basic grounds.

The Statement is only partially correct on p. 23: "The impact of this project is not so much a question of its own impact as it is one of the impact of what the project serves." Indeed, one of the major impacts in the near future will result from the Big Sky and other potential developments. In other places, the Statement acknowledges that the road will aid the economy in the area, but nowhere is the impact of the road's role assessed. Traffic generated by the road is ignored. Section II.A. (p. 23) promises a discussion of the broad impacts of the development but no environmental impacts are mentioned.

Section II.B. (p. 25) offers little more on the impacts on the narrow band adjacent to the project. The discussion is brief with regard to the impacts of construction. Only two paragraphs are devoted to the long-term environmental impacts, mentioning only wildlife and localized fluctuations in the water table. All other environmental impacts are ignored.

The "No-Morning" alternative is dismissed without adequately explaining it. The assumption in the Statement is that if the government does not build and pay for a road, then there will be a low standard road. The alternative of Big Sky providing a quality road to its own facilities is not mentioned.

In general, the Draft Environmental Statement is a shallow, project-serving document, devoid of facts and thorough environmental analysis.

Discrepancy with Policy and Procedure Memorandum 20-8

Policy and Procedure Memorandum 20-8, Public Hearings and Location Approval, is a set of guidelines under which corridor public hearings are held. This memorandum was cited as one of the authorities in the Notice of a Corridor Public Hearing of February 9, 1972. The proposed project has not complied with the intent and letter of the memorandum.

The Department requires that the Police Officer be sworn in as a member of the Department at the hearing. The Police Officer must be sworn in as a member of the Department at the hearing.

Second, the proposed primary spur will pass through public lands to be traded via the land exchanges. Yet, there is no evidence given of assurance that the Federal government has retained a right-of-way easement for this highway prior to completion of the exchanges. Without a right-of-way easement prior to final approval of the exchanges, the situation remains that the Forest Service is trading land to a private owner knowing that DOT will have to buy back some of this exchanged land for right-of-way. Also no mention is made of the fact that by completing the land exchanges all the public land through which the proposed 6.7 mile primary highway passes will have been traded to private ownership, very possibly eliminating public roadside facilities. Because the selected lands in the land exchanges 2 and 3, the economic growth center, and proposed highway project are all located in the same general area, the impacts of each action accumulate considerably. Therefore the Coalition insists that a lead federal agency be assigned to assess the cumulative impacts of the combined federal actions taking place.

DOT's Responsibility to Prepare Their Own Environmental Statements

In a recent decision by the Second Circuit Court, *Oran County Planning Board V. Federal Power Commission*, No. 71-1991 (Jan. 17, 1972), the Court held that the Federal Power Commission (FPC) regulations to implement the National Environmental Policy Act of 1969 (NEPA) are invalid to the extent that they delegate the responsibility for preparation of an environmental impact statement to the applicant for a license. (13) The Court decision states that NEPA "explicitly requires the agency's own detailed statement to accompany the proposal through the existing agency review process." The Court concluded that the FPC was in violation of NEPA by conducting hearings prior to the preparation by its staff of its own impact statement.

As previously mentioned, the environmental statement prepared by the Montana Highway Department for F-20 (1) U.S. 191 Spur is inadequate. We therefore want DOT to immediately assume its responsibility in preparing environmental statements required by NEPA by preparing its own environmental statements for the primary route and growth area approvals, and for the F-20 (1) U.S. 191 Spur project. The Coalition also concludes, based on the above mentioned Court decision, that the April 12, 1972, Corridor Public Hearing for F-20 (1) U.S. 191 Spur is invalid since it is obviously being held prior to the completion of DOT's impact statements.

Summary Comments

(1) DOF's decision to approve the West Fork of the Madison River drainage, an area completely within the boundaries of National Forests, as an area to receive federal funds to promote growth and economic development, selected and surrounding areas is in conflict with the purposes for which the National Forests were established and subsequent Congressional action defining management policy for the National Forests. The Commission believes the decision to approve the West Fork and surrounding lands should be reassessed by DOF and the Forest Service, and a new decision with proper consideration given to Public Laws pertaining to National Forest Management.

(2) The Coalition believes that the West Fork area is of minimal compliance with the requirements of the Federal Highway Administration (FHWA) criteria in Instructional Memorandum PP-10. The type of development taking place in the area will not provide for many years the type of services listed by the FHWA, nor does it appear that the majority of the population will have their permanent homes there. The Coalition asks for more detailed data and studies before being satisfied that the area meets FHWA criteria set forth in Memorandum PP-10. Consideration should be given by FHWA to the appeal by the Economic Development Administration of funds for a similar highway project on the basis that the proposed beneficiary of this project (County, etc.) would not create enough new jobs to accommodate either the unemployment or the retrainable unemployed within Madison County. (19)

(3) The Secretary of Transportation's approvals of the West Fork area as a federal primary spur route (August 20, 1971) and as an economic growth center (November 3, 1971) do, in the opinion of the Coalition, require environmental statements as provided under section 102(2)(c) of the National Environmental Policy Act of 1969 (NEPA). By not providing the required statements with these approvals DOF has violated NEPA, the Council on Environmental Quality's Statements on Proposed Federal Actions Affecting the Environment: Guidelines, 36 Federal Register, 7724-7729, April 23, 1971, and DOT's own agency guidelines for the preparation of environmental statements. Until such environmental statements or declaration of negative impact are provided, the Coalition considers any project proposals and related public hearing premature and in violation of public law.

(4) The "Short Environmental Statement" for Project F-20 (1) U.S. 191 Spur as prepared by the Montana Department of Highways is in general a shallow, project-serving document, devoid of facts and thorough environmental analysis.

The Coalition believes that because the above statement is further deficient for it considers only a 6.7 mile segment of a proposed highway from U.S. Highway 191 to U.S. Highway 267 near Lame, Montana. An environmental statement must be completed on the entire proposed route before any decisions or construction can be instituted on any segment of the corridor.

(5) The selected Burlington Northern, Inc. lands in the Burlington Northern-Forest Service Land Exchanges Nos. 2 and 3, the economic growth center, and the location of the proposed primary spur highway are all located in the same general area. Therefore the environmental and socio-economic impacts of these actions accumulate considerably. Because of the lack of agency coordination to date, the Coalition insists that a lead federal agency be assigned to assess the cumulative impacts of the combined federal actions

taking place. Right-of-way acquisition for the portions of the primary spur through public lands to be traded to Burlington Northern should be obtained prior to the completion of the exchanges.

(6) A recent decision by the Second Circuit Court interprets national environmental policy to require federal agencies to prepare their own detailed environmental statements and that to hold hearings prior to the preparation of an impact statement by its own staff is in violation of the National Environmental Policy Act of 1969 (NEPA).

Therefore the Coalition concludes that the April 12, 1972, Corridor public hearing for R-20 (1) U.S. 191 Spur is invalid since it is obviously being held prior to the completion of DOT's environmental impact statements required for approvals of the West Fork's area as (1) a primary spur, (2) as an economic growth center, and (3) federal-aid highway project R-20 (1) U.S. 191 Spur.

References

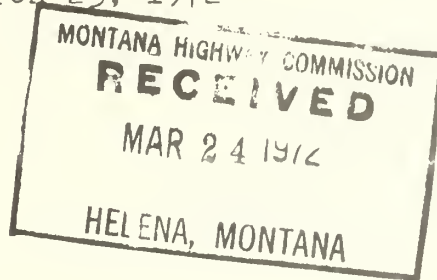
1. Title 46, U.S.C. 475.
2. Title 15, U.S.C. 528.
3. Title 23, U.S.C. 143.
4. Draft Environmental Statement for Project F-20 (1) U.S. 191 Spur, Prepared by State of Montana, Department of Highways, February 9, 1971.
5. Letter from G. D. Marble, Associate Administrator for Planning, U.S. Department of Transportation, December 10, 1971.
6. Land Exchange No. 3 Report, Gallatin National Forest, U.S. Forest Service.
7. Letter from R. R. Bartelsmeyer, Deputy Director, U.S. Department of Transportation.
8. Location Study Report, F-20(1) U.S. 191 Spur, Prepared by State of Montana, Department of Highways.
9. Instructional Memorandum 50-6-71, pp-10, Attachment B.
10. Implementation of Section 102(2)(c) of the National Environmental Policy Act, 1969, Department Guidelines, Department of Transportation.
11. National Environmental Policy Act of 1969, Public Law 91-190.
12. Ronald C. Peterson, "An Analysis of Title I of the National Environmental Policy Act of 1969," Environmental Law Reporter, Volume year 1971.
13. Council on Environmental Quality (CEQ); Statements on Proposed Federal Action Affecting the Environment; Interim Guidelines, April 30, 1970.
14. Minutes of the Montana Highway Commission Regular Meeting, January 25 and 26, 1971.
15. Policy and Procedure Memorandum 20-8, Public Hearings and Location Approval, January 14, 1969.
16. Section 143 of Public Law 91-605.
17. Chief's Responsive Statement: of the Appeal to the Secretary of Agriculture of Proposed Land Exchanges Nos. 2 and 3, dated February 13, 1972.
18. Second Circuit Court, Green County Planning Board V. Federal Power Commission, No. 71-1991 (January 17, 1972).
19. The Billings Gazette, Article by J. D. Holmes, A. P. Capital Writer, Summer, 1970, exact date unknown.

23

H. H. GRANT
Executive Director

Post Office Box 1179
Phone 563-2077

March 23, 1972



F-20 32- GOP
U.S. (1)
191 Spur

Dear Mr. Anderson

It would be most appreciated if you would see that this letter is included in the proceedings of the public hearing your agency is sponsoring regarding this road, April 12, 1972 at Karst Camp.

Should there be any other way in which we could provide support for or assistance on this very worthy project do not hesitate to advise.

Sincerely

Sincerely
Harry Grant
Harry Grant
Executive Director

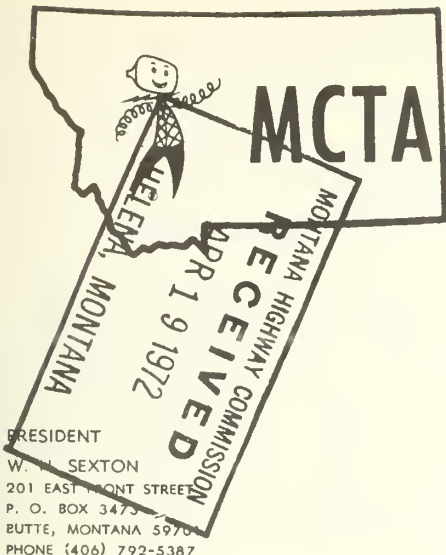
C.C. Walt Myers

ACT	INF	RETURN TO M & F MAY BE RETAINED DIRECTOR
		CENTRALIZED SERVICES
		ACCOUNTING
		DATA PROCESSING
		PLANNING & RESEARCH
		ENGINEERING
		PROG. CON. BUREAU
		BRIDGE
		CONSTRUCTION
		MATERIALS
		PROG. CON. SECTION
		RIGHT OF WAY
		CROSS-VEHICLE WEIGHT
		LEGAL
		MAINT. PLANCE
		MOTOR POOL
		PERSONNEL
		OTHER

MONTANA CABLE TELEVISION ASSOCIATION

AFFILIATED WITH PACIFIC NORTHWEST CABLE TV ASSOCIATION
AND
NATIONAL CABLE TELEVISION ASSOCIATION

April 10, 1972



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Montana State Highway Department
Big Sky Spur
Helena, Montana 59601

Dear Sirs:

The Montana Cable Television Association would like to go on record as supporting the Big Sky project.

It was my pleasure to attend the corridor meeting held on April 12th in the Gallatin Valley.

I did not stand and speak at this meeting because of the fear that the massive amount of irrelevant testimony might cause the meeting to be considered non productive and of little value.

I believe that the Montana State Highway Department has the facilities and expertise to evaluate and properly conclude which route would best serve the interests of the public and the Big Sky.

Thank you for the opportunity to express concern.

Respectfully,

W. H. Sexton, President
Montana Cable Television Association

WHS:so

c. c.: Mr. Chet Huntley

Promoting Better Television

MONTANA DEPARTMENT OF HIGHWAYS

April 12, 1972

Dorothy Bradley
Montana House of Representatives

I wish to state my opposition to the U.S. 191-Spur based on my dissatisfactions with the environmental report of the Montana Department of Highways. I will also submit, with this testimony, a more thorough documentation of these complaints which was embodied in a letter I wrote to Senator Metcalf on March 25 of this year.

I find the environmental report opinionated, skimpy on ecological facts, and sarcastic about what its authors refer to as "the do-nothing alternative." More seriously, I find it in conflict with other material, and incomplete in that the whole contemplated road project has not been included. I will briefly discuss each of these complaints:

1. The second annual report of the Council on Environmental Quality, 1971, makes it clear that all contemplated activity must be included in impact statements.

It is certainly no secret that an extension of the road across the mountain range is a possibility some time in the future, but this portion of the project is specifically excluded from the environmental report. I am convinced that according to the guidelines the whole project should be considered in the impact statement; not just the section proposed for immediate construction.

Furthermore, it is interesting to note that the Montana Highway Commission based the West Fork growth area application on the premise that growth designation would aid Madison County, especially if the road extended directly to that Valley.

2. I mentioned the problem of conflicting information.

a. The economic growth center proposal conflicts with the environmental report. The growth center proposal explains that high priority is assigned to this project because if transportation is not provided, then private capital committed to the area will be withdrawn. On the other hand, the environmental report expresses certainty that Big Sky will proceed with their development, and if transportation facilities are not provided they will be forced to use existing, less expensive, less safe roadways. No mention is made of pulling out private capital.

b. Another conflict exists in the environmental report which states that the land use changes which are presently underway, are not being caused by the proposed highway construction. However, Mr. Lewis Chittin, past Montana Highway Engineer, suggested a southern boundary change of the Spanish Peaks primitive area because of a possible future road. This proposal involves changes of land designation and land use. In my opinion the change would certainly be caused by the proposed highway construction, although it concerns the part of the road which was summarily excluded from the report.

3. Less important complaints deal with the project-serving bias of the report.

a. Page 24 states that considerable public sentiment has been expressed supporting the possibility of a road over the mountain range. It ignores the fact that there has also been considerable public sentiment opposing this possibility.

b. Page 33 states, ". . .the change in land use from ranching and timber harvesting to primarily recreational use will be desirable for future generations."

On what factual ground is that statement made? Should such a land use change be encouraged? And to what financial class of people do second homes, expensive skiing, and golfing appeal?

c. Page 2 states, ". . . the economic impact of this development will be felt by a large area of southwestern Montana. Gallatin and Madison Counties will share in a substantially larger tax base. Restaurants, gas stations, hotels and motels, airlines and other tourist oriented business will benefit. Employment at Big Sky will provide approximately 300 jobs."

I am wondering who will pay the costs of the new airport, the roads, the sewage and garbage disposal, the education for the children of 300 employees, and all the other services. Why is no mention made of the costs of the economic development as well as the benefits? In the Lone Mountain case, as elsewhere, associated costs may far exceed the benefits. Is this not the reason for having impact statements analyze the socio-economic benefits?

Based on the conflicting and inadequate nature of the environmental report, I am opposed at this time to project F-20(1), U.S. 191-Spur.

Box 268, Rt. 2
Bozeman, Montana 59715

March 25, 1972

Honorable Lee Metcalf
Senate Office Building
Washington, D.C.

Dear Senator Metcalf:

I corresponded with you last summer about a boundary modification of your Spanish Peaks wilderness bill proposed by Mr. Lewis Chittim, past Montana Highway Engineer, because of a possible future highway location which would be eliminated by wilderness classification.

The Montana Department of Highways has drafted an environmental report (impact statement) for project F-20(1), U.S. 191 Spur, dated 2/16/72, for a proposed improvement for funding under Title 23, U.S.C., and is submitting it pursuant to Section 102(2)(C) - Public Law 91 - 190. The project, according to the description in the statement of page 1,

. . . begins on U.S. 191 near the mouth of the West Fork of the West Gallatin River. . . . It extends up the West Fork drainage a distance of 9.71 miles, to a point near the base of Lone Mountain and very near the divide between the Gallatin and Madison Rivers. The project is a federal-aid primary spur to federal-aid Primary Route 50.

I find the environmental report opinionated, skimpy on ecological facts, and sarcastic about what its authors refer to as "the do-nothing alternative." More seriously, I find it in conflict with other material, and incomplete in that the whole contemplated road project has not been included. I wish to discuss each of these complaints:

1. The second annual report of the Council on Environmental Quality, 1971, (Guidelines, see enclosure), makes it clear that contemplated activity must be included in impact statements.

It is certainly no secret that an extension of the road across the mountain range is a possibility some time in the future. Page 24 of the environmental report states,

. There is a possibility that this highway may eventually be extended into the Madison Valley and connect with highway 287 near Ennis. Although an extension of the route has not been submitted to the Federal Highway Administration, considerable public sentiment has been expressed supporting this possibility.

(I might add, there has also been considerable public sentiment opposing this possibility. This is a typical example of the non-neutral position expressed throughout the report.)

I am convinced that according to the guidelines the whole project should indeed be considered in the impact statement; not just the section proposed for immediate construction. If this is not accomplished, the door is open for a legal interpretation based on failure to consider the entire corridor.

Also, page 3 of Instructional Memorandum 50-6-71 (PP 10) (prepared for section 127 of the Federal-Aid Highway Act, 1970), states,

Where construction is on new location, or extensive relocation of an existing highway is involved, the studies will consider the entire corridor within which the project is to be located.

It is interesting to note that the Montana Highway Commission based the West Fork growth area application (entitled "Lone Mountain Access Road," dated June, 1971) on the premise that growth area designation would aid Madison County. The application states,

By providing needed highway facility, this project will improve the mobility of the labor force in a sparsely populated rural area -- and particularly so if the road is extended in the future to connect with the highway serving the Madison valley.

2. I mentioned the problem of conflicting information.

a. The economic growth center proposal states that the

. . . West Fork drainage of the West Gallatin River is hereby selected as an economic growth center, and the highway to serve this center is assigned first priority as a highway demonstration project.

The third paragraph of this proposal states,

The high priority assigned to this project results from the simple fact that if the needed transportation facility is not provided, then private capital committed to the area will be withdrawn.

On the other hand, page 32 of the environmental report states,

It is relatively certain that Big Sky will proceed with their development, and a roadway is required to transport people to the upper area. Should they be forced to use the

existing roadway, or some less expensive modification of the existing roadway, the result would be heavy volume of traffic on a low-class roadway with poor drainage, very little surfacing, steep slopes and little or no ditch.

No mention is made of pulling out private capital.

b. I find another conflict on page 2 of the environmental report. A sentence reads,

The change in land use is underway at the present time and is not being caused by the proposed highway construction.

Mr. Chittim's letter to you specifically asks for a southern boundary change of the Spanish Peaks primitive area because of a possible road. This involves changes of land designation and land use. In my opinion the change would certainly be "caused by the proposed highway construction," although it concerns the part of the road which was summarily excluded from the report!

3. Less important complaints deal with the project-serving bias of the report.

a. Page 33 states,

. . . the change in land use from ranching and timber harvesting to primarily recreational use will be desirable for future generations.

On what factual ground is that statement made? Should such a land use change be encouraged? And to what financial class of people do second homes, expensive skiing, and golfing appeal?

b. Page 20 of the environmental report states,

. . . a significant growth is foreseen in winter recreation. This will provide a better balance in the economy of the area.

Many studies point to the contrary, i.e., Squaw Valley, Maine, Colorado, et. al. Certainly the common factor of low paying, seasonal employment is a problem particularly relevant to Montana.

c. Page 2 states,

. . . the economic impact of this development will be felt by a large area of southwestern Montana. Gallatin and Madison Counties will share in a substantially larger tax base. Restaurants, gas stations, hotels and motels, airlines and other tourist oriented business will benefit. Employment at Big Sky will provide approximately 300 jobs.

I am wondering who will pay the costs of the new airport, the roads, the sewage and garbage disposal, the education for the children of 300 employees, and all the other services. Why is no mention made of the costs of economic development as well as the benefits? In the Lone Mountain case, as elsewhere, associated costs may far exceed the benefits. Is this not the reason for having impact statements analyze the socio-economic effects?

I hope you will agree that there are some complications with this project, and I would appreciate any help you can give.

Sincerely,

Dorothy

Dorothy Bradley
Montana House of Representatives

cc: Albert Melcher, ROMCOE
H.J. Anderson, Montana Highway Department
Francis Turner, Federal Highway Administrator
Fletcher Newby, Montana Environmental Quality Council
Clifton Merritt, Wilderness Society
Cecil Garland, Montana Wilderness Association
Gay Easton, Montana Wildlife Federation

Bozeman Montana

Chamber of Commerce
P. O. Box 8 Phone 586-5421

April 12, 1972

Department of Highways
HELENA, Mt. 59601

Gentlemen:

This letter is to confirm the Bozeman Chamber of Commerce stand at the public hearing conducted at the Karst Ranch meeting hall, 7:30 p.m. on April 12, 1972. The Chamber feels that the proposed road between the Upper and Lower Village at Big Sky of Montana is essential.

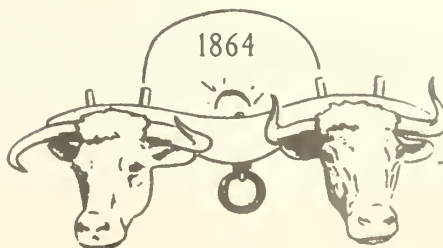
The Chamber, however, urges you to select a route conforming to the natural lay of the land, particularly in avoiding excessive cuts and high fills. We endorse any route which considers the preservation of the natural environment and provides safe transportation.

Sincerely,
BOZEMAN CHAMBER OF COMMERCE



Gerald Willett, Director
Roads & Highways Committee

GW:sm





Gallatin Sportsmen's Association

"Protector of Woods, Water and Wild Life"

Bozeman, Montana
703 West Mendenhall
April 12, 1972



Mr. H. J. Anderson, Director
Montana Department of Highways
Helena, Montana 59601

Dear Mr. Anderson:

SUBJECT: Draft Environmental Statement Project F-20(1) US 191 Spur-
West Fork Gallatin River, Montana-P.L. 91-190 Sec. 102(2)(C).

We appreciate the opportunity to comment on your Draft Environmental Statement and road alignments.

Apparently the important decisions regarding need and finance for the road have already been made by state and federal officials. The citizen participation appears limited to preferred location within a predetermined corridor and comments on the Draft Environmental Statement.

We have no preferred alignment within the corridor. Our concern is that one common error of road construction in the mountains of the west is to destroy many scenic assets with road scars. We hope this has been corrected. We also suggest it would be more equitable if Big Sky, Inc. built the road (meeting state standards) to the base of Lone Mountain and gave it to the state to maintain.

The Draft Environmental Statement is largely limited to a section of road for immediate construction with funds already approved. Statements should be available prior to project approval, not after, as this appears to be. The intent of P.L. 91-190 and guidelines indicate that the total long-term effects of all activities which will likely result must be analyzed prior to approval.

The overall impact of vehicular traffic and demand for road improvement in other locations should also be reported in more detail. For example, the extension of the road to Ennis is merely mentioned by saying there is support for it. It does not state there is also opposition to this road extension. Nor does it include those environmental impacts. Also, the possible future increased traffic on Highway 191 is ignored beyond 1992 ADT projections. Increased traffic from Big Sky will in turn increase pressures and needs for improvements in the narrow canyon portions of Highway 191 alongside the Gallatin River, a trout fishery of National Significance. This would have some predictable consequences on this valuable trout fishery. These are two examples of the error of trying to confine environmental impact studies to individual segments of a road being considered for immediate construction. This must be rectified in the environmental statement.

The Fish and Wildlife environmental impacts analysis are inadequate, lack documentation and are impossible to accept from the viewpoint of

people concerned about fish, wildlife and environment. For example, how much scientific documentation can be offered to support such general statements as:

Some adjustments in the patterns and behavior of wildlife in the area can be expected. Although not as important as some other areas in the Gallatin, the West Fork does support a variety of wildlife species. Their adjustments will vary, with some species avoiding the area and others being attracted to it for one reason or another. (page 26)

Little mention is made about the presence or absense of animals, birds, fish, rare or endangered species, and their relationships to roads and year long people activities as the result of roads. A brief survey among our members and published information show the following wildlife using the West Fork drainage: elk, moose, mule deer, bighorn sheep, mountain goat, black and grizzly bear, blue and ruffed forest grouse; and in addition there are numerous other birds and small mammals.

Areas accessible to motor vehicles the year around are generally not used by some important game animals unless the area is densely forested or certain weather conditions make it neccessary for the animals to forage near the roads in the open. Elk, mountain goat, bighorn sheep, and bear require habitat with wilderness type characteristics. Roads, commercial developments and year long activities effectively stops production of these species in a much larger area than that occupied by the road and commercial developments. To imply the animals will merely avoid the area and live happily in another part of the forest shows you have not considered the already known information on population dynamics and ecology of natural wildlife populations. The environmental statement will not be acceptable until there is a credible ecological analysis for fish and wildlife in relation to the entire road, and to the entire surrounding area influenced by the road and subsequent developments.

Several investigations concerning elk, economics and recreational development in the Gallatin area are completed or underway. However, this information does not appear to have been incorporated into this draft.

Sincerely,



Everett A. Keyes, Vice President



Perry Nelson, Chairman
Natural Resources Committee

Opinions

You're all right, Chet

A few years ago when Chet Huntley quit one of the most coveted television newscaster posts in the world and ended the household Huntley-Brinkley team's daily report to come to Montana to develop Big Sky of Montana, his decision focused world-wide attention on Montana's recreational potential.

At the time, we hailed Huntley as a modern day explorer, comparable to the 1806 expedition of the Lewis & Clark expedition. Our information was based on reports we had received from the Montana Department of Planning and Economic Development.

Perry Roys and his staff advised that in the history of Montana no substantial potential investor had ever preceded his and his associates' decision to expend up to \$40 million in the state with such exhaustive environmental, marketing and recreational studies as had been made before the decision to develop Big Sky of Montana in the Lone Mountain area southwest of Bozeman.

Chet, a native of Montana, wanted to "come home," not as an exploiter, but as a partner for progress. He didn't come to beg—he had a guarantee of adequate financing.

He's never hesitated to narrate a promotional film, to travel around the country to promote Montana and to try to be a good citizen. He gathered up a great staff to comprise the management team headed by Gus Raalum, a world famous skier and a resort management expert who came from the Jackson Hole country. His legal counsel is David Penwell, another native Montanan who had acquired considerable experience in handling legal matters for Colorado ski areas.

But, despite the support of the Montana Congressional delegation, Governor Forrest H. Anderson, the big majority of Montanans, the Montana and local Chambers of Commerce, there are some real opponents who now would do everything possible to wreck the Big Sky project. At every turn of the road they have thrown obstacle after obstacle. First, there has been the proposed Forest Service-Burlington Northern land exchange on Lone Mountain and then on proposed highway access to the area. Normally, the investment of \$20 to \$40 million dollars with the prospect

that the annual expenditure of Big Sky and its guests would be welcomed with open arms. Surely, Montana needs more business, just to replace the current decline in the state's economy.

Tonight at 7:30 at Karst's Camp, about 35 miles south of Bozeman and U.S. 191, 10 miles from Big Sky, there will be an important hearing on the proposed locations of a federally funded highway to the resort. Big Sky has put up the cash for the first portion of the road from U.S. 191 to Meadow Village and the hearing will be on that portion of road to run 6.7 miles west from Meadow Village, the lower Big Sky complex, to Lone Mountain, site of the Montana Village Ski area.

Secretary of Transportation John Volpe recently approved Big Sky as an "economic growth center" and thus the federal share of the highway cost will be about 86 per cent while the state's share will be about 14 per cent. Big Sky's opponents contend the \$20-million, 10,647-acre year-round resort will have a severe impact on an "environmentally fragile" area due to potential rock slides and unstable shale and sandstone. But, the proponents contend that the engineering and environmental studies would provide adequate safeguards.

Big Sky has invested millions in preliminary engineering, the construction of condominiums and other buildings at Meadow Village and is ready to go on the Mountain Village and Lone Mountain ski runs. It has focused attention on Montana's recreational potential. People who come here to retire, to fish, to play golf, to ski, to snowmobile or just to relax spend money to eat, fly, sleep, drink and for countless other contributing items to bolster the state's economy.

Yellowstone National Park's tourism has contributed far more than the gold and silver dug up from the ground.

When Chet Huntley announced his plans we hailed them because of the preplanning. There've been other projects since far more deplorable from an environmental standpoint.

Chet should have a run for his money, not a washout and a black eye that would set Montana back in the eyes of the country for years and years to come. The road project needs endorsement, not censure.



RETURN TO M & F
WAY BE RETAINED
DIRECTOR
CENTRALIZED SERVICES
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REGION SECTION
ROADSIDE WAY
GROSS VEHICLE WEIGHT
LEGAL
MAINTENANCE
MOTOR POOL
PERSONNEL
OTHER

April 13, 1972

Department of Highways
Helena, Montana 59601

Re: Project F-20 (No. 1, U. S. 191 Spur)

Gentlemen:

I attended the meeting on the above captioned corridor hearing last evening. In contrary to what the newspapers said about the unruly order of this meeting, I think you fellows did a good job in handling the questions that were thrown at you.

I would like to go on record as supporting this project. As you people are the experts in your field, I would like to see you people pick out the most logical route for this project and go ahead and get the job done as quickly as possible.

I sincerely believe that this is the type of industry that should be promoted in our state and we should get behind this project and move it along to its full economic realization.

Yours very truly,

R. E. Bodin
811 South Tracy
Bozeman, Montana 59715

Date Recd. Preconst. 4-14-72	Initial	Attach	MAIL ROUTE	Info	Act
			30 G.O.P. RMH		
			30 Field Design		
			30 Surfacing Design		
			31 Office Engineers		
			32 West Region		
			32 Landscape		
			33 East Region		
			34 Hydraulic		
			36 Traffic		
			37 Pub. Hearing		
			38 Sec. Roads		
			39 Consultant Design		
			File		

3

MONTANA HIGHWAY COMMISSION
RECEIVED
APR 17 1972
6 N.
Bozeman
April 17

Inc.
lands

HELENA, MONTANA

6 N. Wallace Ave.
Bozeman, Montana 59715
April 14, 1972

Re: Project F-20(1)
U.S. 191 Spur

This alternate has two bad points; the first is a large (45 foot) cut in the vicinity of station 205, and the second is the large (60 foot) fill required in the vicinity of station 218. Both of these would have a severe impact (visually) to

Mr. H.J. Anderson

April 14, 1972

the people who will be living in the closely adjacent residential areas. Also, if I am not mistaken, the 60 foot fill is right in the same area that Big Sky intends to use as an equestrian area. This proposal also approaches very close to the Lone Mountain Dude Ranch, depriving it of some of its privacy.

Compromise Alternate:

On the attached copy of your aerial photos, I have sketched the approximate location of a route which is flagged on the ground in orange ribbon at 7%; the location is shown colored red. Since this route is almost exactly the same length as the length of Alternate C it would replace, the grade will not change appreciably. The advantages to this proposal are:

1. does not require any clearing to speak of.
2. entirely on a southerly exposure.
3. avoids Big Sky's equestrian area.
4. avoids the Dude Ranch area.
5. skirts the proposed lake area.
6. requires only one small (20-25 foot) fill.
7. has acceptable alignment and grade.
8. nearly follows the Middle Fork Road (minimizing disturbance)
9. would have the least visual impact on the environment

The only disadvantage if this proposal is the fact that it would traverse a 60% sideslope, for about 400 feet on the east side of the unnamed draw, just about where the Middle Fork Road now goes. The soils (some shale) appear to be stable and since later portions of the road will be traversing equally steep slopes, this short segment should not present any particular problem, considering the standard of the road and your professional expertise. Beyond this point, Alternate C, in my opinion is the obvious and best alternate. The only other portion of the proposed Alternate C which I feel is critical is the proximity to the slide area. I had some difficulty finding the stakes in this area due to the snow, but I am well satisfied that your revised location does completely avoid this problem area.

In the event you choose to give these comments some consideration, and would like to look at this location in the field, I will be very willing to go along. I have attached my business card for your convenience.

Mr. H.J. Anderson

April 14, 1972

I have no other specific comments relative to your Draft Environmental Statement, and feel that, although brief, the statement was well put together and spoke to the issues frankly and honestly.

Thank you for this opportunity to be a part of your decision making process.

Respectfully,

W.J. Parson

W.J. Parson
Resident Forester

copies: Mr. J.P. Duke-B.N.I.
Mr. Guss Raaum- Big Sky
Mr. Ken Galick- Gallatin N.F.

Date Recd. Preconst.		4-12-22		
Act	Info	MAIL ROUTE	Attach	Initial
		30 GOP RMH		
		30 Field Design		
		30 Surfacing Design		
		31 Office Engineers		
		32 West Region	<input checked="" type="checkbox"/>	
		32 Landscape		
		33 East Region		
		34 Hydraulic		
		36 Traffic		
		37 Pub. Hearing	<input checked="" type="checkbox"/>	
		38 Sec. Roads		
		39 Consultant Design		
		File	<input checked="" type="checkbox"/>	



RECEIVED
MONTANA HIGHWAY COMMISSION
APR 17 1972
HELENA, MONTANA

RETURN TO
MAY BE
DIRECTOR
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ENGINEERING
GENERAL INVESTIGATION
COAST GUARD
PATROL
S. VESSEL
MARINE
MILITARY
PELLETTIER
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MONTANA HIGHWAY COMMISSION
RECEIVED
wedding receptions
APR 17 1972
HELENA, MONTANA

music nightly • private parties • orders to go

April 15, 1972

State of Montana
Department of Highways
HELENA, MONTANA 59601

RE: Project F20
(1) U. S. 191 Spur.

Gentlemen:

I recently was a passenger on the bus from Butte and attended your public hearing April 12, 1972. However, due to the large number in attendance I was unable to speak.

I am one hundred per cent in favor of the U. S. 191 Spur in order to help "BIG SKY" get up off the ground.

I have twenty-five employees in my place of business and the only way I can keep them is to push private industry.

Unless we have this I feel that we do not have a chance.

Thank you.
P. M. "SANDY" Keith
P. M. "SANDY" Keith
Very truly yours,

CC: Bob Koprivica
Chet Huntley

broadway and wyoming • butte, montana 59701 • phone 406-792-8011

Board of County Commissioners

Madison County

Phone 843-5444

Highway Commission

Helena City, Montana

59755

APR 18 1972

HELENA, MONTANA

CHARLES RAYMOND, Chairman
Shepherd, Montana

NEIL J. MORGAN, Ennis, Montana
DOUGLAS ALLEN, Silver Star, Montana

April 15, 1972

State Department of Highways
Helena, Montana

Dear sirs:

I would like to comment on the proposed U.S. Highway 191 Spur, as to the testimony given during the hearing.

Too much time was spent there on opposition to the entire Big Sky Corporation project, very little to discuss the actual subject of the hearing. Since it deteriorated into a public debate and forum for various political discussions, I decided to withhold any statement, and offer this comment by letter, as it was my understanding that this is also admissible as part of the hearing.

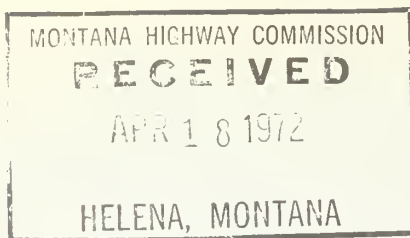
Some opposition, namely that opposing use of public funds for the purpose of opening a highway route to a private enterprise, has some foundation, but we must weigh the good against the bad and decide accordingly. With this in mind, I would like to go on record as favoring the construction of the Highway 191 Spur, using whatever alternate State Highway engineers deem most suitable. This road will benefit the entire state, and will specifically benefit Madison and Gallatin counties.

Sincerely,

Douglas Allen

Douglas Allen
Madison County Commissioner

INF	RETURN TO M&F
	MAY BE RELAYED
	DIRECTOR
	CENTRALIZED SERVICES
	ACCOUNTING
	DATA PROCESSING
	PLANNING & RESEARCH
	ENGINEERING
	DESIGN BUREAU
	BRIDGE
	CONSTRUCTION
	MATERIALS SECTION
	RIGHT-OF-WAY
	TRAFFIC
	VEHICLE WEIGHT
	MAINTENANCE
	MOTORPOOL
	PERSONNEL
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RETURN TO N & F MAY BE REFILED DIRECTOR	CENTRALIZED SERVICES ACCOUNTING DATA PROCESSING PLANNING & RESEARCH	ENGINEERING DESIGN CONSTRUCTION MATERIALS PRECONSTRUCTION SIG. & OF-WAY PAVING & WEIGHING LEASING FINANCIAL GENERAL
ACT. INF.		

April 16, 1972

Department of Highways
Helena
Montana

Dear Sir;

On April 12, 1972, I attended your corridor hearing on the US 191 spur into Big Sky of Montana. I had tried to draw no prior conclusions and went to the meeting to listen to the evidence presented and then to write my conclusions to you to be included in the hearing record.

During the 2½ hour hearing, I listened to several supporters give campaign speeches for themselves, several canyon residents who just happened to have land bordering on Big Sky support the road, representatives from various Chambers of Commerce from all over the state spout the virtues of the project, and of course, the real estate agents. The supporters of the state financed road proposal all had two things in common; first, they all stood to make money if the Big Sky project became a reality, and second, none of them seemed to know anything about the technical aspects of the road proposal, or care about them. If you looked real hard, you could almost see the dollar signs in their eyes. They would have seemed more appropriate carrying signs saying: "Bucks for Bozeman", "Loot for Livingston", or "Money for Madison".

Another block of speakers also commented on the road proposal. This was the group opposed to the public financing of the road. This group was composed of lawyers, engineers, environmental groups, college students, and interested persons.

This group also had two things in common, first they had all carefully read the highway department proposal and environmental impact statement, and second, they all had statements which were well prepared and represented a good deal of time and effort, even if there was no material gain to them in stopping the road proposal.

So, from the evidence given, I make the following proposal to the highway department concerning the Big Sky road. I feel it is a very bad precedent to provide public funding for a road which serves only a private venture. The Big Sky project is not intended as a public recreation area, will never become such, as for this reason should receive no public monies. An extension of the proposed road as far as Ennis is useless, wasteful, as a great detriment to the environment of the area. The funding of the Big Sky road was pushed through by a small number of vocal special interest groups and is not in the interest of the people of the state of Montana.

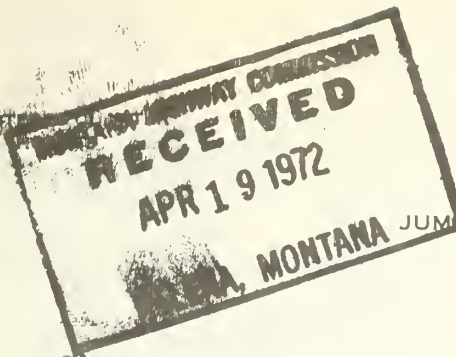
Thank you.

Yours truly,

William Carlson

William Carlson
P.O. Box 234
Gallatin Gateway, MT 59730

REGISTER



7

COMMERCIAL
HEREFORD CATTLE

ROBERT M. BECK
JUMPING HORSE STOCK RANCH
ENNIS, MONTANA 59729

4-17-72

Dear Sirs;

I am writing this letter so as to be placed in the record as opposed to the construction, funding, and maintainance of the proposed spur connection with U.S. 191 at Big Sky in the Gallatin canyon. As the state has power to administer the funds, I feel that they would be put to better use in more demanding areas. The broadning of the tax base would probably be negligible.

Sincerely,

Jim Allison
Jim Allison, Mgr.

ACT	INF	RETURN TO M & F
		MAY BE RETAINED
		DIRECTOR
		CENTRALIZED SERVICES
		ACCOUNTING
		DATA PROCESSING
		PLANNING & RESEARCH
		ENGINEERING
		PRECON. BUREAU
		BRIDGE
		CONSTRUCTION
		MATERIALS
		PRECON. SECTION
		RIGHT-OF-WAY
		GROSS VEHICLE WEIGHT
		LEGAL
		MAINTENANCE
		MOTOR POOL
		PERSONNEL
		OTHER

Public Hearing

Date Recd. Preconst. <u>4-19-72</u>			
Act	Info	MAIL ROUTE	Attach
		30 GOP RMH	
		30 Field Design	
		30 Surfacing Design	
		31 Office Engineers	
		32 West Region	
		32 Landscape	
		33 East Region	
		34 Hydraulic	
		36 Traffic	
		37 Pub. Hearing	
		38 Sec. Roads	
		39 Consultant Design	
		File	

MAIL FILE ✓
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Date Recd. Preconst. 4-19-72	Initial	Attach	MAIL ROUTE	Info	Act
			30 GOP RMH		
			30 Field Design		
			30 Surfacing Design		
			31 Office Engineers		
			32 West Region		
			32 Landscape		
			33 East Region		
			34 Hydraulic		
			36 Traffic		
			37 Pub. Hearing		
			38 Sec. Roads		
			39 Consultant Design		
			File		

Ennis Hot Spring Resorts

Ennis, Montana, 59729

Box 641

April 18, 1972

Department of Highways

Helena, Montana

Dear Sirs:

I am speaking as a long time tax payer and resident of Ennis, I would very much like to see the road to Lone Mountain developed. I don't have much special knowledge of the land conditions on the Galliten side, so will agree with the ~~opinions~~ of the people who have studied and do know. I feel that the development of a road thru to the Madison side is a long over due project for our area, and that the Highway department is very much to be complimented on their actions in looking at this area and developing it for the use of the public. I feel that to develop the land for easier access to the public is essential for our whole economic progress, not for just the special few who are able to afford and enjoy pack trips etc. Many older people are not physically able to do these things, they could enjoy a good scenic drive, these people have probably been the ones who have worked through many years of poor economic conditions and can now afford car trips, so should be provided the pleasure of seeing what is some very beautiful forest areas.

Sincerely yours,

Helene Thewissen

cca

MONTANA HIGHWAY COMMISS
RECEIVED
APR 21 1972
April 18 HELENA, MONTANA

ACT	INF	RETURN TO M. S. F.	MAY BE RELEASED	DIRECTOR	CENTRALIZED SERVICES	ACCOUNTING	DATA PROCESSING	PLANNING & RESEARCH	ENGINEERING	RECORDS & COMM.	CONSTRUCTION	MATERIALS	PRECONSTRUCTION	MAINTENANCE	CROSS SECTION WEIGHT	LEGAL	MAINTENANCE	MAINT. POOL	PERSONNEL	OTHER
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Department of Highways
Helena, Montana

Dear Sirs:

After attending the public hearing in Gallatin Canyon concerning the road to Big Sky, I decided to add my comments to the discussion.

First of all, I do not think Big Sky, Inc., as a private real estate development program, is legally entitled to public funds for construction of the proposed road to Big Sky. Furthermore, I am personally against the use of public monies for such a project. I will cover each of these contentions in greater depth as this letter continues.

Now, let me cover Big Sky, Inc. and its applicability as an economic growth area under section 143 of the Federal-Aid Highway Act of 1970 (P.L. 91-605). Big Sky does not meet the objectives of this act. While it is geared to existing regional development plans and it does offer growth through natural resource development, ie. recreation, it is a private real estate development program and not the type of area to which this law was directed.

One of the primary purposes for declaring an economic growth area is to relieve urban congestion and, where possible, check or reverse current rural to urban migration. A second home project such as Big Sky does not fulfill these requirements- for a majority of its residents do not live or work there on a permanent basis.

Prior to development by Big Sky the permanent population of West Fork of the Gallatin River was three persons. Its present permanent population is zero. This is a far cry from a major restriction of economic growth areas, that they not exceed 100,000

population. With its projected population Big Sky is, in reality, the creation of a new town and, therefore, ineligible for designation as an economic growth area. The Secretary of Transportation's Criteria for Selection and Approval of Growth Center Highways and Demonstration Highway Projects, in subsection (13) of section B specifically states that, "New towns which are satellite or bedroom communities of metropolitan areas are not the type of communities to which this legislation is addressed."

I also contend that the Montana Highway Commission's application to the Department of Transportation for Big Sky as an economic growth area is inadequate. It does not meet the requirements of Instructional Memorandum 50-6-71 PP10 on the Selection of Economic Growth Areas and Development Highway Demonstration Projects, for it does not include "relevant economic and social data" on the present condition of the proposed growth center and target areas, "major impediments to development, present intermodal transportation facilities and their linkages to growth center markets, the rural hinterland, and the overall transportation network; and the possible impact upon the area and region resulting from more adequate transportation connections." Rather, the application is an attempt to justify Big Sky and make it appear that it will benefit many local citizens. For example, only the combined populations of Gallatin and Madison Counties (37,519) is stated. The actual permanent population of West Fork or Gallatin Canyon is not mentioned. There is no in-depth discussion of problems created by Big Sky such as increased taxes, additional housing, educational and health needs, etc.

Supposedly, one of the major benefits of Big Sky will be the creation of new jobs. However, the work is seasonal and of the type that is usually low paying, eg. waitresses, chambermaids, caretakers, instructors etc. It is also doubtful that many of these employees will be employed on a permanent or year-around basis. What is more likely is employment on a rush-season basis. I question the benefits of these jobs for Montana citizens since Big Sky is exempt from the state minimum wage law and there is no guarantee that Big Sky will employ Montanans.

I am not against recreational development for it is less detrimental than certain other industries, but to what extent is the public to subsidize it? The last session of the legislative spent much time solving problems presented to it by Big Sky. The sewage facilities at Big Sky are, at least in part, to be constructed with public funds. The proposed road has already cost \$212,000 of highway tax money and an additional estimated amount of \$1,700,000 will be needed to complete it. It is my opinion that before committing more tax money to such a project, Big Sky should prove its economic viability. It may end up costing the taxpayer much more than he gains.

There are other priorities in Montana that need more immediate attention than a road to Big Sky. This allocation is especially questionable when, as the draft environmental statement admits, private funds would be used to construct the road anyway.

I appreciate the opportunity to comment on this important issue.

Sincerely,

A handwritten signature in cursive script that reads "C. T. Ripley". The signature is fluid and written in dark ink.

C. T. Ripley

2230 West Main

Bozeman, Montana

1160 Evans Ave. ^{Mail & File 51}
Butte, Mont.

April 19, 1972

Montana Highway Dept.

Helena, Montana

Dear Mr. Anderson:

In relation to the Big Sky road in the Gallatin Canyon I believe the State of Montana should be reimbursed for the cost of the road. It is a private road and the taxpayers money is for public roads which are in dire need of many new ones. All the people can testify to that.

I believe the Big Sky Project is fine and they should be able to repay

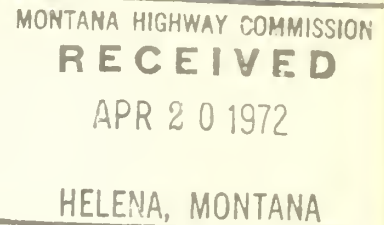
The money when it get 52
into operation.

I'm also against giving
them the road because
there will be many requests
for private roads and what
we do for one we will
have to do for all.

Thank you,

Very truly yours,
Mrs Charles Hoffo

280
53
April 19, 1972



Montana Highway Department
Helena, Montana

Regarding: Corridor Hearing on Project F-20 (1), U.S. 191 Spur

Gentlemen:

I wish to register my objections to the use of public funds to construct a Federal-Aid Primary Highway Spur, a dead-end road, 6.7 miles long, which will serve essentially one property owner. Along the proposed route there exists only one habitation- a guest ranch, and at the terminus there is not one person residing, or one permanent building or work of any kind, except the clearing up of some slash left by lumbering operations. Present traffic into the area, except for curiosity seekers, is nonexistent. There is no demonstrated need for a public road, especially a Primary Highway. This appears to me to be a blatant misuse of public funds for the purpose of raising the value of undeveloped land (within a National Forest) which is held for speculation.

In addition, I challenge the use of Federal funds on the basis of Policy and Procedure Memorandum 20-8, paragraph 3, "Applicability", which states:

- b. If preliminary engineering or acquisition of right of way related to an undertaking to construct a portion of a Federal-Aid highway project is carried out without Federal-aid funds, subsequent phases of the work are eligible for Federal-aid funding only if the nonparticipating work after the date of this PPM was done in accordance with this PPM.

At the Corridor Hearing, April 12, 1972, it was stated that some \$500,000 (part private, part public money) had been spent on the first three miles of this proposed spur and on surveys and preliminary engineering of the 6.7 miles now presented to the public, all without public hearings. Surely the purpose of paragraph 3 is to insure that the public is involved in determining the need for, the costs, the consequences, and the location of any Federal-aid highway before the public's view is clouded and its judgment influenced by these preliminary actions. Although you have designated the first three miles as a different project from the 6.7 miles, I maintain that the actions of the Montana Highway Commission and the Montana Highway Department, and the dates of these actions, show that the 9.7 miles has been considered by you to be, and is, really all one project. I maintain the funds already spent on the first three miles, as well as the 6.7 miles, preclude Federal-aid funds for any further work on any part of the road.

Right of way costs were not available at the Corridor Hearing, but were said to be available on request. I request the following

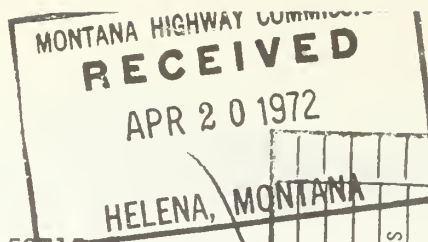
information concerning costs and dates of work done so far, and estimated future costs:

1. How much public money has been committed by contracts, agreements, or resolutions on the 9.7 mile spur, what are the dates of these actions, what are the sources of the money, and how is it divided between the first three miles and the 6.7 miles?
2. How much public money has been spent on the road as of April 12, 1972, and how are the expenses divided between the two portions of the road?
3. How much has the private developer contributed to the road and in what form have his contributions been made? What are his contractual commitments on the road for the future?
4. Please give a breakdown of the area of right of way acquired for the first three miles, including from what parties it was acquired, the dates of acquisition, and how much each party was paid or credited (or will be paid or credited) for right of way.
5. What is the present designation of the first three miles of road (State, Primary, Secondary, etc), and on what date was it so designated?
6. Please give a breakdown of the right of way estimated to be needed for the 6.7 mile section, including the area to be acquired from each party (if more than one is anticipated to be involved) and the estimated payments or credits to be made to each party.
7. What is the estimated total cost of the 6.7 mile section?

In addition, I raise the objection that the Environmental Impact Statement did not consider alternatives to the proposed action as required by the Environmental Policy Act. If the purpose of the action (highway construction) is to transport people to the proposed Big Sky Winter Village, then other methods besides a highway should be considered, including electric railways and aerial cableways, which would have minimal environmental effects.

Thank you for your consideration.

W.O. Keightley
W.O. Keightley
Route 3 Box 122
Bozeman, Montana



P. O. Box 1335
Bozeman, Montana 59715
April 19, 1972

Mr. Don Anderson
Public Hearings Division
Preconstruction Section
Montana Dept. of Highways
Helena, Montana 59601

RETURN TO M & F MAY BE RETAINED DIRECTOR	CENTRALIZED SERVICES	ACCOUNTING	DATA PROCESSING	PLANNING & RESEARCH	ENGINEERING	PRECON. BUREAU	BRIDGE	CONSTRUCTION	MATERIALS	PRECON. SECTION	RIGHT-OF-WAY	CROSS VEHICLE WEIGHT	LEGAL	MAINTENANCE	MOTOR POOL	PERSONNEL	OTHER
ACT	INF																

Gentlemen:

I attended your hearing held at Karst Ranch April 12 on the proposed Lone Mountain spur road but did not testify. Following is a written statement I wish to be included in the hearing record (we were told we had 10 days in which to do this).

I cannot approve of any of the alternatives offered because I do not believe the road should be built. Taxpayers should not be obligated to fund a road for private enterprise.

Designation of the area as an Economic Growth Center is especially objectionable. I believe it is an improper designation in view of the fact that the primary purpose of Big Sky, Inc. is realty development. This will provide relatively few jobs for Montanans.

I further feel the environmental impact statement is extremely inadequate. The statement should by all means consider the effects of any further road development in the area, i.e. extension of the spur to Ennis. I would object very strongly to any such development in light of the extremely unstable area through which such a road would have to pass.

It was interesting to me that many of the people speaking for the road addressed themselves to the economic benefit of Big Sky on the younger generation, yet not one member of the "younger generation" spoke for the road - all were against. When will people realize that a job without space in which to live, move, and enjoy natural things doesn't mean much to most of us.

Sincerely,

Karen L. Ross

Karen L. Ross

cc: Highway Dept., Bozeman

Mail & file

57



Rt. 3, Bozeman, Mont. 59715

April 19, 1972

Department of Highways
Helena, Montana 59601

Dear Sirs:

Testimony pertaining to Project F20(1) - US 191 Spur

Please include the following statement in the hearing record for the hearing on the above Project held April 12, 1972 at Karst's Ranch in Gallatin Canyon.

We wish to register our strong objections to:

- (1) the expenditure of any state money to build this road,
- (2) the expenditure of any federal money to build this road.

Had we the opportunity, we would have expressed our objections before any state money was spent at all.

We feel that Big Sky of Montana, with 19 million dollars to invest, should pay for building its own road. The current project, to essentially connect two separate parts of its own development, seems even more unjustified than the access road built last summer. It is our understanding that two other large recreation developments are under construction in Montana right now, and they are financing their own roads, as they all should.

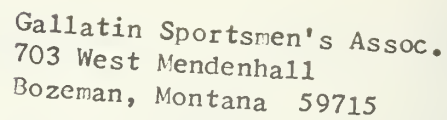
We feel it is particularly inappropriate to use the particular federal funds that are proposed to finance this highway. It appears to be a complete disregard of the intentions of Congress when appropriating those funds. They were appropriated to help relieve the urban transportation crisis by improving the rural situation and farm to market roads. A primary highway to a select, high income recreation area will not relieve the urban transportation crisis.

Sincerely yours,

Beth Miller

Bob Miller

Mr. and Mrs. Bob Miller
Rt. 3, Bozeman, Montana 59715



Administrator
Montana Department of Highways
Helena, Montana 59601

The Board of Directors and the Natural Resources Committee of the Gallatin Sportsmen's Association wishes to go on record as supporting the comments submitted by the Ad-Hoc Coalition of Concerned Organizations, Canyon Route, Bozeman, Montana regarding U. S. 191 Spur, Gallatin County, Montana.

Sincerely,

Everett Reyes

Everett Keyes
Vice-president

Perry H. Nelson
Perry H. Nelson
Chairman, Natural Resources
Committee

AC	NO	U. N. T. O. M. & F.	NOT TO BE RETAINED	DIRECTOR	CENTRALIZED SERVICES	ACCOUNTING	DATA PROCESSING	PLANNING & RESEARCH	ENGINEERING	PRICON, BUREAU	BRIDGE	CONSTRUCTION	MATERIALS	PRICON SECTION	RIGHT OF WAY	GROSS VEHICLE WEIGHT	LEGAL	MAINTENANCE	MOTOR POOL	PERSONNEL	OTHER
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Big Sky of
MONTANA HIGHWAY COMMISSION
Montana
P. O. Box 100
Big Sky, Montana 59706
April 2 1972
(406) 763-4249
Director
HELENA, MONTANA

Director of Design
NA and
Construction

Mr. H. J. Anderson
Director of Highways
MONTANA HIGHWAY COMMISSION
Helena, Montana 59601

Attn: Mr. G. O. Powers
Mr. K. F. Skoog
Mr. Jack Beckert

Gentlemen:

The purpose of this document is to qualify and clarify the position of Big Sky of Montana relative to the proposed 191 Spur into the Big Sky and Lone Mountain Recreation Complex. The following conclusions have been reached after considerable time and exploration by Big Sky, in an honest effort to establish an all weather scenic road to the Lone Mountain complex, having the least degrading effect on the general environment.

To supplement the above, I might add that several of us here at Big Sky have walked an alternate route with Mr. W. J. Parsons, Resident Forester for the Burlington Northern, and agree that the new route has some advantages over any of the A, B, C, D or E routes. The compromised alternate which we shall call B1 has some of the following advantages.

1. It could be built practically on grade most of the way.
2. It does not require any substantial clearing.
3. It would eliminate the 65' fill and the severe 45' cut which would be necessary if the C Route were used.
4. It will traverse the proposed lake.
5. It would have acceptable grades.
6. It would have acceptable alignment.
7. It would require only some small fills, possibly 20 to 25'.
8. It would preserve the privacy of Lone Mountain Ranch (one of the finest in the State).



Montana Highway Commission

Page 2

April 20, 1972

9. It would follow very closely, the Middle Fork logging road, thereby minimizing additional disturbance scars, cuts and fills on the face of the slope.

10. It would preserve an ideal location for the Big Sky Horse and Rodeo Facilities which was located since the Master Plan was conceived several years ago.

11. It would preserve the view up and down the valley by eliminating the 35' fill which would be necessary if Route C was used.

12. It could provide easy ingress and egress to the residential development served by Little Coyote Road.

13. It would have a southern exposure for the entire length.

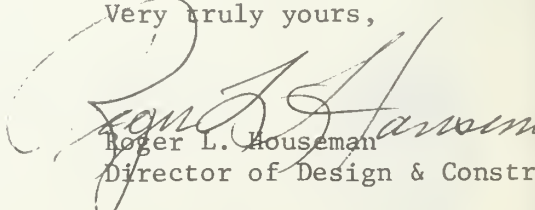
14. By holding close to existing grades, it would not bisect and degrade the beautiful North Fork Valley as would the C Route.

15. It would provide a scenic road with smooth curves and acceptable grades. It is proposed however, that it continue into an intersect with the large curve at the old sawmill rather than extend to the West as Alternate E.

May I compliment you on the manner in which you conduct the meeting and thank you for the opportunity to express our view in the location of this very important alignment.

May we respectfully request that the above reasons will justify serious consideration and ultimate implementation of Alternates B or B1, which Big Sky feels would greatly enhance the proposed Lone Mountain Trail, thereby making it one of the truly scenic and safe Montana Highways.

Very truly yours,


Roger L. Houseman
Director of Design & Construction

Route 1, Box 16
Bozeman, Montana 59715
April 20, 1972

Department of Highways
Helena, Montana

Dear Sirs:

I wish to comment on the proposed spur from U. S. Highway 191 to Big Sky's Mountain Village proposal.

I would like to go on record as being opposed to spending either State or federal money on this project.

It is obvious that the "Economic Growth Center" boundaries were drawn to benefit the Big Sky development. They do not represent the area in the West Fork-Beaver Creek drainages that have the potential for "Recreational Residence" development. The "Economic Growth Center" boundary lies 1 mile south of Big Sky's property boundary. Murray McCormick studied the area and found that land suitable for "Recreational Residences" extended 5 miles further south. Therefore, it appears that the "Economic Growth Center" designation was not based on studies on the economic growth potential of the area, but was simply a means of getting federal money for a road from Big Sky's Meadow Village to Big Sky's Mountain Village.

Since there is very little development potential on either side of the proposed road for several miles, I question the justification of this road on the basis of economic development. At the end of the road, the proposed site of Big Sky's Mountain Village, only slightly more than $3/4$ of a section is suitable for development. I question spending 1.9 million dollars to build a road so that Big Sky can develop $3/4$ of a section of land at the site of their Mountain Village when there are several sections of land owned by Taylor and Simkins or Burlington Northern that are suited for development and located where road costs would be minimal.

There is considerable evidence that Lone Mountain does not have unusually good qualities for a ski area:

1. Although Lone Mountain has a summit of 11,166 feet, only the area below approximately 9,900 feet is suited for skiing. According to Rykken Johnson (Rocky Mountain News, July 19, 1970) who studied Big Sky's Master Plan, the Village lift terminals would be at 7,800 feet. Therefore the verticle fall available for use by skiers is 2,100 feet. This may fluctuate by approximately 200 feet as the height of the upper terminal has not been published after **a rock glacier in** the lift area was discovered which is expected to force Big Sky to terminate the upper terminal 100 feet lower than planned. According to Rykken Johnson the upper terminal would have been located at 10,000 feet.

In the Sept. 16, 1971 Gallatin County Tribune and Belgrade journal, Gus Raaum states, "We will start out with four lifts which will end at the bottom of the circ of Lone Mountain, which is about 1,000 feet below the top.

"Because of the slopes, it is impossible for skiers to go to the top.

"It would be very spectacular if they did.

"I would hate to be in charge of the ski patrol that would have to pick up the bodies".

Therefore, in spite of the fact that Lone Mountain has an elevation of 11,166 feet, only approximately 2,100 feet of verticle drop would be available for use by skiers.

2. According to the Forest Service's Final Environmental Statement on land exchanges 2 & 3, the average annual precipitation is 29 inches. Therefore, snowfall for skiing may be marginal. Snowfall in the Bridger Bowl area exceeds 50 inches.
3. A rock glacier which may be moving has been discovered. This may mean that the proposed Mountain Village might be in danger of rock and earth slides if another earth quake occurred.
4. Wind which may remove snow and hinder tow operations is common in the area. The upper slopes are open and extremely subject to wind damage and perhaps avalanches of drifted snow.
5. There is little potential for expert skiing. Rykken Johnson states, "The high run's first leg is about ~~one~~ and 1/4 miles long, dropping 1,200 feet, and appears to represent the only expert slope on the hill".

I know we cannot justify spending 1.9 million dollers so that Big Sky can develop 3/4 of a section of land, and before we decide to spend 1.9 million to build a road for a ski area on Lone Mountain we should investigate the skiing potential of other mountains which would aid in the development of the entire area designated as "Recreatioanl Residence" by Murray-McCormick.

A ski area built on Cinnamon Mountain would aid in the development of the entire developable area nearly as much (or perhaps more) than a ski area on Lone Mountain. Cinnamon Mountain has a summit of 9,235 feet and boarders U.S. Highway 191 at 6,800 feet. Since all of the verticle drop of this mountain could be utilized by skiers, a ski area on this mountain would have a verticle drop of 2,435 feet, which is approximately 300 feet more usable verticle drop than would be available on Lone Mountain. No tax dollers would have to be spent for additional roads.

If it is necessary to stimulate the economy by spending tax dollers for roads, the possibility of building a ski area on Pioneer Mountain should be investigated. A ski village could be located at the intersection of Muddy Creek and the South Fork. A ski area on this mountain would have a verticle fall from 9,861 feet to 7,200 feet or 2,661 feet, which is approximately 500 feet more than the usable verticle fall on Lone Mountain.

A road to Pioneer Mountain would pass approximately through the center of the land designated as "Recreational Residence" by Murray-McCormick, would have developable land along both sides, and would benefit 5 land owners rather than one as would the road to Lone Mountain. Such a road would aid the development of approximately 24 sections, not merely 3/4 of a section.

Since there is no evidence that Lone Mountain possesses extra ordinary qualities for a ski area, it appears that the only reason for building a road to Lone Mountain is to enable Big Sky to develop 3/4 of a section of land. Why is the government favoring Big Sky. I am sure that some of the other private land owners in the area are just as interested in developing there land.

It is ridiculous for the government to attempt to spend 1.9 million dollars on a road to a ski area on Lone Mountain without demonstrating that a ski area on Cinnamon Mountain, which lies along an existing highway would not be just as satisfactory.

Although I am against development inside the National Forest boundaries for reasons which I stated orally at the hearing, I feel that if development going to take place it should be done in the most economic and logical manner and government support should not favor one land developer over another.

I ask that this statement be included in the April 12 th hearing record.

Yours truly,

Russell L Berg
Russell L. Berg

Gus Raalum Outlines Big Sky's

An outline of Big Sky's progress and problems was presented by Gus Raalum, to the Montana Planning and Economic Development Commission at the resort's dude ranch Monday evening.

Raalum stated that in the development of the Meadow Village area they have almost completed the construction of 50 condominiums.

Almost half of these condominiums have been sold, "and mostly to people from Montana," said Raalum.

The Meadow Village area will have an 18-hole golf course with room for expansion.

The sports area will also include areas for minor football, soccer, basketball, archery, bicycling, a skeet trap, and a swimming pool.

An indoor sports area will also be built for indoor basketball, wrestling, and indoor tennis.

A new telephone building and power building are also being planned.

Raalum added that all power and telephone lines will be underground.

Interspersed among the condominiums there will be homes built to "help break up the monotony," said Raalum. A club house will be built in the center.

Although the commercial activity will be limited in Meadow Village, there will be a small restaurant-bar combination, general store, all-purpose building and temporary business offices for Big Sky.

Lake Reduced

Raalum stated that they have reduced their plans for the size of the 55-acre lake originally planned in the Meadow Village area.

"We found through drilling and soil testing that to hold a lake of that size it would cost us \$800,000 to build a dam," he stated, "so we reduced the proposed size to about 10 acres."

"In doing so we will also be able to save a beautiful stand of trees which we didn't want to lose."

"This lake will be in front of the condominiums in the Meadow Village, and will in effect act as a sediment pond."

"I know some of you are very unhappy about the muddy West Fork, but unfortunately there is no way of creating an instant dam or instant channel change."

"We have to go across the creek and we have to build it."

"We hope that any future disturbance will settle in the sediment pond."

Dude Ranch

Raalum went on to say, "We have up-graded the dude ranch a bit."

"The barn has been made into a meeting room with a western bar in the corner, a tack room faces the corrals, and upstairs we have built in quarters and dormitories for our hired help."

"We have also winterized the cabins."

"We have planned small meetings here this fall and so we are slowly gaining some activity."

"During the winter we plan to use the ranch for skiing guests who like this atmosphere of skiing."

"We are also working on the possibility of having a U.S. Olympic team stay here for about 10 days to train."

"This would probably involve about 40-45 skiers."

Mountain Village

Whereas the Meadow Village will be summer oriented, it will remain open for winter activities.

The center of winter activities will be at the upper Mountain Village, which will also be the center of commercial activity.

The proposed convention center will be at the Mountain Village as will the major shopping and service areas.

"The last and final hurdle is the land exchange," said Raalum, "since the land exchange will effect our plans on which way to build the Mountain Village we won't know which way to go until after the exchange."

"We have been trying to plan around it and may go ahead and build as though the land exchange will not go through."

"We would like to start construction of the Mountain Village next summer."

Skiing Facilities

Raalum commented on the skiing facilities, stating, "We will start out with four lifts which will end at the bottom of the circ of Lone Mountain, which is about 1,000 feet below the top."

"Because of the slopes, it is impossible for skiers to go to the top."

"It would be very spectacular if they did."

"I would hate to be in charge of the ski patrol that

would have to pick up the bodies."

Sub-stations Hidden

Raalum explained that all power substations would be hidden in the woods, and he pointed out that special effort had been made to put up green tree, narrow carrying capacity poles with non-reflecting wire.

These lines are being put up behind trees where possible, and the lines will be run under ground to the substation.

Raalum was questioned about the overnight capacity of Big Sky when completed.

He replied, "There will be two types of residents staying up here, one will be permanent and the other temporary."

"We expect to have 300-350 employees who will stay here all the time."

"We will provide housing for them although this will be transient housing since we will have a turn over between summer and winter help."

"As far as temporary guests, during the next 10 years we hope to have a capacity of 6,000-7,000 beds."

"It could grow bigger, it all depends on if everything goes alright."

"We do have a maximum on the development, however, because we are only going to build on 25 percent of the land."

Tax Base

"Is there any estimate on what this development will do to the tax base of Gallatin and Madison counties?" Raalum was questioned.

"There will be 1,600 residential lots," said Raalum, "which will be sold at an estimated value of \$15,000 each."

"If you put at least a \$20,000 house on each lot, over the years they will be worth \$20-30 million dollars."

"These will be homes owned by people who don't live here and won't be demanding any services."

"In addition there will be approximately 15,050 condominiums, which will sell at an average of \$20,000-\$40,000 apiece."

"Again they will be owned by people who will not be permanent residents."

"So you could end up with a \$100 million worth of value without any requests for public services."

Local People Hired

Raalum was then questioned as to whether they were hiring Montana people.

"All of the contractors are local," he stated.

"We did hire a firm from Oregon to build the golf course."

"We are trying to honor a moral commitment to hire Montana people first, but it isn't always possible because the talent is just not available."

"How many skiers do you expect on any given day?" was another question from the audience.

"Probably around 6,000, which will be smaller than Vail," said Raalum. "But the conditions will not be crowded since this will cover a four mile area and we may even expand this area to the north."

Good Snow

Raalum also commented on climatic conditions, saying, "The average temperature is in the 20's."

"I was amazed and so far very pleased with what I have learned about the snowfall and wind."

"We are about as sure as anywhere in the United States of having snow on Thanksgiving."

Planning

Rick Mayfield, city-county planner, asked Raalum, "If there had been regulations when you came here, how would this have affected Big Sky?"

"We zone and plan ourselves ten times more than any county would dare to."

Raalum was then asked about how they planned to set up their municipal services and streets.

"Now there is a sewer district and the main reason for forming the district is to qualify for the Water Pollution Control Board funds."

"I'd like to see eventually having all the utilities as public services rather than privately owned."

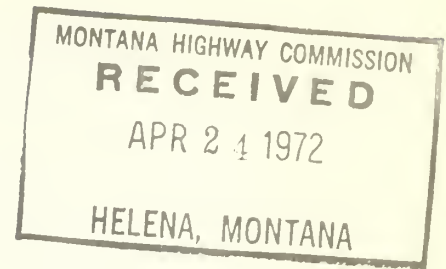
"They are then cheaper to operate and maintain."

Golf Course

He went on to say, "If we ever make a dollar on the golf course, it will be a surprise to me."

"If we can break even on the golf course it will supply a service that will be a supplement to the rest of the development."

Comments and Questions
on the
Proposed U.S. 191 Spur, F--20(1)



We were very dissatisfied with both the nature and the conduct of the hearings held at Karst Ranch on April 12, 1972. The hearing was purportedly for discussion of alternative routes from U.S. 191 to the Upper Village of Big Sky, Inc. Yet at no time does the Highway Department acknowledge, in its Impact Statement or anywhere else, that one legitimate alternative is "no route." Those in charge of the hearing allowed testimony to that effect but there were also campaign speeches, diatribes against some sinister control over the minds of our youth, and other irrelevant drivel.

During the hearing the bar was operating full blast in the adjacent room which proved to be extremely distracting to a large portion of the audience. There was also the added distraction of occasional forays by people in varying stages of intoxication, making fools of themselves and denying those by the door the opportunity to hear what transpired. In the future such hearings should be held where a bar is not available or closed for the duration of the hearing.

Several questions were raised and not adequately covered.

Among them:

1. Why is the Highway Department financing (through state and federal funds) a roadway through (what will become) private

lands to a private real estate and recreational development?

Is this free enterprise or subsidized enterprise?

2. What steps can be taken to ensure that the government will not have to purchase right-of-way through land that may have recently been selected out of federal lands in Forest Service/Burlington-Northern Land Exchange #3? It seems that if such steps are not taken the process of land exchanges and road building will unduly enrich private developers at the expense of the general public.
3. What is the projected employment of Big Sky, Inc. and what ~~types~~ types of jobs will be available? Will the employment be seasonal or will it provide a stable, year-round source of jobs? Also, will the jobs be primarily of an unskilled nature with a preponderance of minimum-wage openings?
4. How can this project be justified under the Economic Growth Center Demonstration Project provisions of the Federal Aid-Highway Act of 1970? Will Big Sky, Inc. affect the rural to urban trend and will it provide a "service center" as well as an "employment center?"

It is realized that the above questions are concerned with inter-departmental and intergovernmental questions and copies have been forwarded to the various agencies involved. But these questions should and must be considered, not in a piecemeal manner, but as a coordinated whole. There is a certain momentum built into such projects when considered piecemeal that causes irrational decisions to be made concerning continuation of projects. We feel that such

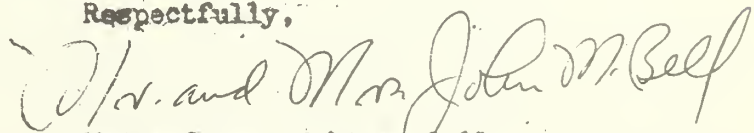
47

practices are not within the intent of the National Environmental Policy Act of 1969.

There is a disturbing problem of earmarked funds from sources such as the Highway Trust. While there are pressing highway needs throughout the state, it seems that such needy projects must go begging because money that becomes available has a narrowly defined objective. In the case of Economic Growth Center Demonstration Projects we in Montana must hunt around to find a plausible project so as to not "lose" our funds. This practice fosters unresponsive government and contributes to a lack of faith in the efficacy of government, particularly by those people who must daily drive over substandard roadways while at the same time a corporation with substantial backing can come into the state and get the road it claims it needs.

Until the questions raised above are satisfactorily answered, we cannot support continued funding of Project F--20(1).

Respectfully,



Mr. and Mrs. John M. Bell
904 Peter Koch Tower
Bozeman, Montana 59715

STATE OF
MONTANA

DEPARTMENT OF PLANNING AND ECONOMIC DEVELOPMENT

MAIL:
CAPITOL STATION
HELENA 59601

OFFICES:
1716 NINTH AVENUE
406 449-2400

April 21, 1972

MEMORANDUM

TO: Montana Highway Commission

FROM: Department of Planning & Economic Development

SUBJECT: Comment on Project F-20 (1) U. S. 191 Spur Draft
Environmental Statement

The Montana State Department of Planning and Economic Development has been given the state responsibility in section 82-3705 of the Revised Codes of Montana, 1947, for "recreational planning and development which is directly related to private investment in recreation facilities". As a result, this department has worked closely with the larger recreational developments in the state in the last several years to insure recreational facilities of high quality and sound planning.

The Big Sky of Montana project is an excellent example of cooperation between developers of a private recreational complex and agencies of federal, state and local governments. This department has worked closely with the Big Sky planners to assure that the development is on a sound basis to maximize benefits and minimize environmental impacts. An outgrowth of the Big Sky project has been the establishment of the Gallatin Canyon planning study to provide a guideline for future land use for the entire Gallatin Canyon. This is one of the initial examples of regional planning in Montana that has involved a number of governmental agencies working with private citizen groups and local businesses coordinating their efforts to develop a well planned section within Montana.

The department has likewise worked with the Montana Highway Commission to provide an efficient transportation facility capable of meeting the recreational and employment needs of the development as well as responsive to all environmental considerations. A review of the Highway Commission proposal alternatives has been conducted, discussions held with Highway engineering personnel, and the route alternatives reviewed in the field. A review was conducted of the Highway Department preliminary estimates of road length, average grade, maximum grade, maximum fill-height, maximum degree of curvature, total deflection of alignment, average degree of curvature, cubic yards of evacuation, and slide areas.

COMMISSIONERS

FD ST H. ANDERSON
(RNDR

PERRY F. ROYS
CHAIRMAN AND
EXECUTIVE DIRECTOR

ROSS W. CANNON
HELENA

FRANK CRISAFULLI
GLENDOVE

DALE C. HAWKINS
BILLINGS

W. L. BILL HOLTER
GREAT FALLS

JOHN RUFFATTO
MISSOULA

Memorandum
April 21, 1972
Page 2

The departmental findings are as follows:

GRADE: Alternatives D and E were found to be least desirable with grades of 10% and 8.8%.

MAXIMUM FILL HEIGHT: Based upon maximum fill height alternatives A and D were found least desirable with fill heights of 85 and 90 feet.

CUBIC YARDS: Alternatives C, D and E are 50% or greater in cubic yards of evacuation than alternatives A and B.

SLIDE AREAS: Alternative A crosses an old slide area.

OTHERS: Length of road, total deflection of alignment, average and maximum degree of curvature were given less consideration than the first four physiographic considerations.

Alternatives D and E were initially eliminated based upon average grades (4.57% and 5.38%) and maximum grades (10% and 8.8%). Alternative A was next eliminated based upon a major unknown, the crossing of an old slide area.

The first major fill area on alternative C is located in a conspicuous area as seen from the existing meadow village and is esthetically in conflict with Big Sky's master plans. Although alternative B's maximum fill height is 75 feet, or 16 feet higher than alternative C, it is located in an inconspicuous location and does not conflict with any known planning. The total cubic yards of evacuation of alternative C with 782,000 cubic yards is almost 50% greater than that of alternative B with 548,000 cubic yards.

Based upon the previous analysis, alternative B is recommended by this department as the best location for the proposed highway center line.

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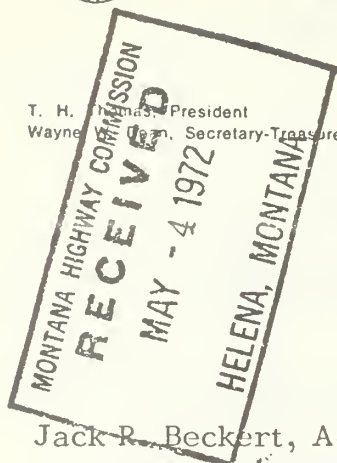
THOMAS, DEAN & HOSKINS, INC.

Consulting Engineers

T. H. Thomas, President
Wayne Dean, Secretary-Treasurer

OFFICES IN GREAT FALLS AND BOZEMAN

1200 Twenty-Fifth Street South
Great Falls, Montana 59405
761-3010 Area Code 406



May 3, 1972

Jack R. Beckert, Acting Administrator
Engineering Division
Montana Department of Highways
Helena, Montana 59601

RETURN TO M & H	ENGINEERING	IN CON. BUREAU	BRIDGE	CONSTRUCTION	MATERIALS	DESIGN	STUDY	TRAIL OF WAY	SPURS	VEHICLE ALIGN.	TRAFFIC	ADDITIONAL	REMARKS	OTHER
MAY 15 1972	PLANNING & DESIGN													

Re: Public Hearing
F-20 (1) U S 191 Spur

Dear Mr. Beckert,

In regards to the recent public location hearing on F - 20 - US 191 Spur, we would like to have the following entered into the public hearing transcript;

Thomas, Dean & Hoskins, Inc., favor alternate B. It is our opinion that it will provide the most useable alignment with the least adverse impact to the surrounding environment. It is our understanding that this route has the least severe vertical alignment of any of the alternates presented. We further understand that the cuts and fills on this alignment are generally less severe than those anticipated on the other alternates.

If the alternate alignment described at the public hearing by Mr. W. J. Parsons proves to be a practical route, we see no major objections to that route.

We appreciate this opportunity to participate in development of this badly needed transportation facility.

Please send us a transcript when they become available.

Very truly yours,

THOMAS, DEAN & HOSKINS, INC.

By:

Douglas E. Daniels, P. E.

ENGINEERING STUDIES - DESIGN - SURVEYS

#22-70

DED/lk

RESPONSES TO ENVIRONMENTAL COMMENTS

GOETZ: Both the Draft Environmental Statement and this Final Environmental Statement have been prepared in accordance with PPM 90-1, which is the applicable Federal Highway Administration instruction. These instructions apply to all federal-aid highway projects nationwide and until PPM 90-1 is changed by proper authority, projects in Montana will continue to follow these instructions.

ANACKER: Pressure will increase on the Spanish Peaks whether the road is built or not. The road will make very little change in the accessibility of the Peaks.

HAGLUND: Use of lands within the boundaries of the national forest for recreational and summer home purposes is not new to this area or the forests in general. Further, actions to promote these uses are not necessarily detrimental.

The economic growth center application for the West Fork area was submitted in accordance with Instructional Memorandum 50-6-71. It was found to meet the criteria and has been approved by proper authority.

The Federal Highway Administration has stated, "The designation of Lone Mountain Access Road as a demonstration project is not an administrative action requiring an environmental statement."

The Montana Department of Highways has not proposed extending the route to connect with U.S. 287. Some private individuals and groups have voiced support for such a proposal. There has also been opposition to this proposal. The spur route that is now proposed and which ends at the upper village in no way commits the agencies involved to ever propose an extension of the route. The various proposals for establishing the Spanish Peaks Wilderness Area boundaries must be resolved before an extension of the route can be given consideration. Even if this question is resolved, a complete study of the economic and environmental aspects of such a proposal would be required.

Big Sky Inc. has donated, at no cost, the right-of-way required from them for the first 3 miles of the spur. They have stated that they will also donate the right-of-way required from them for the upper 6.7 miles.

REICHMUTH: The corridor studied for this project considered all reasonable alternatives and the use of Beaver Creek or the South Fork would not meet the objectives of the project.

Questions regarding geological features were adequately answered in the transcript.

CUMMINGS: The land use changes occurring in the West Fork area are well known and fully discussed in the Draft Environmental Statement. The designation of this area as an economic growth center has been approved by proper authority with full knowledge of the growth and growth potential of the area. The approval of the land exchange by the U.S. Forest Service was made with full knowledge of the growth expected in this area. Only a small portion of the area designated as a growth center will be developed in the near future and this will be mainly on private land, not public domain. Development within National Forest boundaries is the rule, not the exception, because a great deal of private land is included within the forest boundaries.

WILLET: As stated in the Draft Environmental Statement, the design standards and alignment and grade for the project are compatible with the type of terrain being traversed.

DAVICK: The statement of the Gallatin Sportsman's Association is included in Appendix A.

STEIN and
JACKSON:

Both Senator Stein and Mr. Jackson asked questions with regard to the priority of the subject project with respect to other highway needs. Some of the projects mentioned are on other than the Primary System; particularly the Bridger Canyon road. Since funds for one system cannot be used for a project on another system, the roads such as Bridger Canyon will not be affected.

Within the primary program, the subject project has been assigned a high priority. The determination as to which projects will provide the greatest benefit is the responsibility of the Montana Department of Highways.

Because this project qualifies as an economic growth center project, the federal matching ratio is increased from 66% to 86%. This will decrease the amount of state funds required and enable the state to make maximum use of available funds.

HAGLUND: The statement of State Representative Dorothy Bradley is included in Appendix A.

WRIGHT: The documents referred to by Dr. Wright are a part of the Montana State University - National Science Foundation study.

BERG: Mr. Berg is right. The Forest Service is charged with the responsibility of protecting the National Forests and reserving parts of the public domain from settlement. They are performing this function on millions of acres of land in the State of Montana. Mr. Berg disagrees with how the Forest Service is managing a small portion of this area. We agree with what the Forest Service has done and will continue to work with them in coordinating our highway project with their management objectives.

ERICKSON: The editorial from the Livingston Enterprise supports the Big Sky Development and the road project because of their economic impact on the area.

PERRY: We agree with Mr. Perry on the "lead agency" concept, although rather than having another study done, we feel that this environmental statement should not have been prepared because the Forest Service statement adequately covered the situation.

DOUGHERTY: The balance between economic development and environmental protection is discussed very well by Mr. Dougherty.

PARSON: The recommended alternate is a combination of alternates B and C, as proposed by Mr. Parson.

MYERS: The subject highway will be built to a higher standard than the Skalkaho road and it will have a greater impact on the surrounding area.

CORRIGAN: The reason for using state and federal funds to construct the highway is that the completed highway is for the use of the general public. The road will serve not only Big Sky property, other private owners and public domain lands, but mainly it will serve the road users who will pay for it.

ANDERSON: Information which had been published by Montana State University at the time the Draft Environmental Statement was prepared has been used as reference material. Since that time, more information on their study has been released and this information has been included in the Final Environmental Statement.

STEVENS: It is true that Big Sky will have an impact on Yellowstone Park and vice versa. However, the magnitude of this impact will probably be quite small.

APPENDIX C

MONTANA STATE UNIVERSITY - NATIONAL SCIENCE FOUNDATION STUDY

The latest report by Montana State University is included in its entirety. This report contains a wealth of information as to the present environmental conditions and what may result from the Big Sky development. This information and the results of future studies will be used in the design of this project.

We are most appreciative to Montana State University for allowing the inclusion of this report in the Final Environmental Statement for this project. Dr. James J. Jezeski and Dr. John C. Wright have been of great assistance in this regard.

The Impact of a Large Recreational Development Upon
a Semi-Primitive Environment: A Case Study

Continuation Progress Report and Proposal
Submitted to the National Science Foundation
by

Montana State University
Bozeman, Montana 59715
May, 1972

The Impact of a Large Recreational Development Upon
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Continuation Progress Report and Proposal
Submitted to the National Science Foundation
by

Montana State University
Bozeman, Montana 59715
May, 1972

Progress Report and Continuation Research Proposal
Submitted to the National Science Foundation

by

Montana State University
Bozeman, Montana 59715

THE IMPACT OF A LARGE RECREATIONAL DEVELOPMENT
UPON A SEMI-PRIMITIVE ENVIRONMENT: A CASE STUDY

Principal Investigator

Name James J. Jezeski
Title Coordinator, Environ-
mental Studies
Social Security No. 473-03-8814
Dept. Affiliation Botany and
Microbiology

Co-Principal Investigator(s)

Wm. Lassey, Director, Center for
Planning and Development
John C. Wright, Assoc. Coord., CES
Robert Emerson, Industrial Manage-
ment Engineering
Anne Williams, Research Associate
Center for Planning and Develop-
ment

Continuation request second year

Proposed starting date July 1, 1972 Amount requested \$241,000
Proposed duration
in months 12

Endorsements:

Principal Investigator

Name James J. Jezeski
Signature _____
Title Coordinator, Environ-
mental Studies
Telephone No. 406/587-3121
Ext. 443
Date _____

Dean

Richard H. McBee

Dean, Col. Letters
and Science
Same, Ext. 265

Institutional
Administrative Official

Roy E. Huffman

Vice President for
Research
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Introduction

To recapitulate events leading to this progress report, the preliminary grant on the Gallatin Canyon project was awarded to cover the period July 1, 1970 to June 30, 1971. The proposal for the current grant which succeeded the preliminary one was prepared to meet a December, 1970 deadline; and so the progress report covering the preliminary grant included work done during only a period of about five months from July 1 to December 1, 1970. Thus, the present progress report covers work done since that time: namely from December 1, 1970 to about March 1, 1972.

While the baseline data collection began at the resort area and in the Gallatin Canyon during the summer of 1970, on many of the individual sub-projects this process continued through the summer of 1971 because of a somewhat delayed construction schedule at the lower village site. In the case of only a few sub-projects principally of a socio-economic nature was it possible to begin measuring trends and impacts due to development stimuli.

A summary of the principal steps in the resort development would be as follows. During the winter of '70-'71, improvements and the construction of convention facilities were carried out at the Lone Mountain dude ranch. Heavy construction began in the spring of 1971 and during this construction season a road was rerouted and improved from Highway 191 to the lower village (about 4 miles). Condominiums were erected and largely completed, the golf course was constructed with tees, greens, and most of the fairways seeded. The central water system (for domestic use and irrigation) was placed in operation and the sewage treatment plant was about completed. There was no significant public occupancy or use of the lower village facilities during

1971 and the increased human contact in the area was due to the resort project workers rather than resort clientele. However, the lower village condominiums are ready for occupancy in the summer of 1972 and consequently the sewage treatment system will be placed in operation - and this latter event could potentially be important as to environmental impact.

Because of the delays in getting a decision on the land trade involving Burlington-Northern and the U. S. Forest Service which if completed would result in the vital Section 30 coming under resort ownership, plans for the development of the upper village and the ski facilities could not be finalized. Land trades #2 and 3 were very recently approved by the Secretary of Agriculture, but the decision is now being legally contested in Federal district court. Accordingly, it would appear that during the summer of 1972 major construction probably will not begin at the upper village and ski area, and any such activities would be confined to road improvement from the lower village to the upper village site to permit the movement of heavy equipment and construction materials and to the initial ski facility work including clearing of runs and beginning the lift installations.

Thus, at the resort site and in the West Fork drainage, development activities in 1971 resulted in only minimal environmental perturbations except of course for dust clouds and some incidents of muddy streams due to highway construction. However, elsewhere in the Canyon and neighboring areas, there were some indications of increased economic and sociological impacts. Traffic, whether of the idly curious or those with genuine interests in the resort began to swell, land transactions were stimulated and there are indications of satellite business developments. So trends and patterns of change are beginning to emerge, at least according to the observations made on several of the sub-projects.

In some ways, the summer of 1972 should bring opportunities for environmental changes to occur at the resort site. Condominiums will be occupied, the golf course presumably will be playable in the late summer and the sewage treatment facility will be placed in operation. Some fairly large convention, educational, and athletic group activities are scheduled for the resort and there may be some very substantial earth moving operations above the lower village. For the first time, there will be substantially increased human activities in the West Fork area.

Progress Report

An adequate study of the impact of large scale recreation development on the Gallatin Canyon and surrounding region can help determine the degree of compatibility of such developments with environmental quality and contribute to making proposed developments in other parts of the nation more congenial and less destructive to the environment.

To accomplish the above it is imperative to prepare a list of environmental variables, identify the important ones and develop a conceptual overview of the environmental variable system. From this approach a valid model will be developed that will be applicable to other regions. Furthermore the organization of an interdisciplinary research team that can successfully accomplish such a task could serve as a guide for investigating other complicated holistic problems.

It is a necessity that such research take into account existing laws regulating land use and human behavior in order that information be placed in the hands of responsible governmental agencies when the investigators perceive a situation where misuse can result in serious environmental, social, and economic damage. If current legislation is inadequate to provide corrective action to prevent environmental damage then assessment of environmental change by the research team will provide a fund of objective data that can serve as a basis for corrective legislative action and policy changes by the appropriate government agencies.

Some citizens, locally and nationally, have expressed the view that the economic gains anticipated from the development will not offset the loss of environmental quality and the desirable social order they now

perceive. Measurement of the pre-development economic, social and environmental qualities will provide a baseline against which to measure how changes resulting from the development will result in qualitative and quantitative deviations from the present conditions that are so highly valued by people who enjoy the present wilderness environment.

With this in mind, it is necessary to examine the environment of the Gallatin Canyon as it was in the recent past, as it is now and on the basis of this comparison attempt to project the changes resulting from future developments and to assess the economic, social and political forces that are set in motion by such developments. The ability of the research team to project ahead the complex interrelated changes now occurring, based on knowledge of present conditions and observed short term trends and unanticipated new changes will be the supreme test of the success of this venture.

In order to demonstrate the interdisciplinary ability of our research team to analyze a complex system and construct a holistic model from such an analysis this progress report will describe past progress during year one, proposed research during year two, justification of deviations from those described in the approved grant, information presented to user groups and how such information was used. The order of presentation will be dictated by the closeness of relationship of the individual research projects to each other and the logical sequence that we assume is necessary if we are to demonstrate that we have made sufficient progress to justify continuation of the grant. Projections from information gathered and anticipated trends will be presented whenever it is considered strategic to do so.

Until the twentieth century, the Gallatin Canyon saw little human activity. Even the Indians seldom frequented it, except for such primitive tribes as the Sheep-eaters. Fur trappers frequented this prime beaver region during 1801-1860, and there was some (but little) mining activity after 1860. But neither trapping nor mining had much impact upon the isolated Gallatin Canyon. In fact, the federal government did not even systematically explore the Canyon until the Hayden Survey in 1872. During the period 1880-1907, however, human activity in the Canyon rapidly increased. Large-scale ranching and lumbering, the Canyon's two "traditional" land uses, began to appear at this time.

The real "opening" of the Upper Gallatin locale came during 1905-1914. During this time, the area was placed in the Gallatin National Forest, and thus "preserved"; the road was laid out to West Yellowstone; dude ranching began; and Bozeman capitalists built a railroad spur line to near the Canyon mouth, selling the line to the Milwaukee Railroad in 1910. Since that time, tourism and federal policy have steadily risen in Canyon importance, increasingly displacing lumbering and grazing as the important influences. Subsequent attempts to "develop" the Gallatin Canyon - efforts, for example, by the Bureau of Reclamation to dam the river during the 1930's and again during the 1950's, or the frustrated oil "boom" during the 1940's - have been opposed, largely by local sportsmen and dude ranchers and by the Forest Service. The growth of recreational activities, the rise in federal regulatory powers, and the increased activities of large corporations like Burlington Northern and Chrysler Realty have had a substantial impact on

the area, and for the most part, these developments have been unsuccessfully resisted by local Canyon residents.

Two important findings have emerged from the historical studies. First of all the Gallatin Canyon residents have had virtually no impact on the decisions that affect the Canyon. Outside private and governmental interests have usually been successful in promoting their activities. Secondly there have been several waves of development in the canyon that have risen, leveled off and declined. These have been the resultant of outside powerful interests. We are now witnessing the beginning of another wave which many assume will have an exponential growth for some time. However this is a most unrealistic assumption and an attempt should be made by this group to study the historical growth and decline of other recreational developments in the nation and determine the finite life of the Big Sky enterprise in the light of future changes in economic conditions, types of other recreational activities, changing social values that will be particularly related to the changing age structure, and attitudes of our population. In other words it should be possible to make some generalizations about recreational succession.

However, for the next year work plans for the historical study will be to complete work in progress and because of budget restraints this will be all that can be supported.

Upon completion of the next years research the historian will prepare a comprehensive manuscript for publication in Montana: The Magazine of Western History. This journal reaches 20,000 readers with each issue, the largest such circulation in the United States. It should therefor acquaint many citizens in or out of Montana with our project and its importance. The

author is also a member of the editorial board of the magazine.

In connection with the renewal of this grant next year, results of the present historical study certainly have opened up some concepts worth following through.

The major current uses of the Canyon are residential and recreational. Baseline data from 1970 indicate that fifty-one permanent resident families made their homes in the Canyon prior to construction of the resort. Summer residents numbered 198, including 76 holders of Forest Service lease permits. In addition, 34 non-resident land owners held private property in the Gallatin Canyon, for a total of 283 current property owners.

Major recreation uses of the residents include (1) camping, (2) hunting, (3) fishing, (4) snowmobiling, (5) hiking, (6) horseback riding, and (7) sightseeing. Baseline data indicated a slight degree of dissatisfaction among the current user groups. Small proportions of each group complained that other users detracted from their enjoyment of the Canyon. We anticipate that present users will continue to affect each other in this manner and that as new user groups enter the area, the intensity of "conflict-in-use" will increase. Research conducted in this aspect has been and is being correlated with recreation interests of tourists, fishermen, hunters and campers being studied by other members of the study team and wilderness users in cooperation with the U.S. Forestry Services Laboratory, Missoula, Montana.

As a baseline, estimates of present intensity of recreational activities have been prepared by the research team and U. S. Forest Service personnel (Table 1).

Table 1

RECREATION USE IN GALLATIN CANYON--1971

Camping--

Number of camping spaces:

Unorganized--38 sites--room for 110 vehicles

Organized (Forest Service)--17 sites--room for 134 vehicles,
plus Red Rock Campground (when opened) will have 76
camping spaces

Snowmobilers--

Estimated for Gallatin County portion of Canyon:

3,000 snowmobile visits

2,000 visitor days (1 visitor day - 12 hours)

Forest Service Cabin Lease Permits--

76 in Canyon

Hunters--

Estimate: 4,100 per season in entire Canyon

People days:

West Fork: 1115 (# of hunters = 551)

Gallatin Canyon: 11,446 (# of hunters = 4,809)

Ski Touring--

Estimate: 25 people using the Canyon 1 or more times during the winter

Hiking--

Spanish Peaks Gallatin County: 3500 visitor days

Spanish Peaks Madison County: 1,110 visitor days

Remainder of ranger district - Gallatin County: 1,000 visitor days

Remainder of ranger district - Madison County: 100 visitor days

Fishing--

Rivers and Streams

Spanish Peaks - Gallatin County: 100 visitor days

Spanish Peaks - Madison County: 100 visitor days

Remainder of ranger district - Gallatin County: 16,000 visitor days

Remainder of ranger district - Madison County: 2,000 visitor days

Lakes and Ponds

Spanish Peaks - Gallatin County: 700 visitor days

Spanish Peaks - Madison County: 100 visitor days

Remainder of ranger district - Gallatin County: 900 visitor days

Remainder of ranger district - Madison County: 700 visitor days

Enjoyment of Unique or Unusual Environment--

Spanish Peaks - Gallatin County: 1000 visitor days (due to Lava Lake)

Spanish Peaks - Madison County: 400 visitor days

Automobile Driving--

Gallatin County: 33,000 visitor days

Madison County: 800 visitor days

As the Big Sky complex grows there will undoubtedly be an influx of people with different recreational interests that in some respects will be in conflict with present users and consequently will necessitate public and private changes in policy and management. Next year we will begin to carefully document the type of recreational succession resulting from the growth of Big Sky and other satellite activities.

As an example of recreational succession Figure 1 depicts the potential user conflicts as the resort complex develops and the resulting impact with an important recreational activity - hunting. Analysis of the hunter data should indicate "hunter preferences", or the characteristics which constitute a "quality hunting experience". As new users enter the Canyon (snowmobilers, skiers, etc.), they are likely to affect the quality of the hunter's experience. Likewise, hunters may affect the quality of other recreationists' experiences. These impacts will probably result in public policy decisions, such as limiting the number of hunting permits issued. As permits are curtailed, hunters will seek substitute leisure-time activities, or will go elsewhere to hunt thus increasing hunting pressure elsewhere.

We anticipate that the 1971-72 hunter preference data will provide an excellent baseline for our hypothesis of "recreation" or "user succession". Although the data is not yet complete, present indications support the hypothesis that as the resort complex develops, hunting will eventually become a recreation activity so incompatible with other recreation uses that hunters will be forced to look elsewhere to hunt (see Figure 1).

As new Canyon recreation activities develop, more facilities will be built, and the potential for conflict between residential and recreation

Hunter Interview Data

- Most important reasons to hunt big game
- Best things about hunting in Gallatin Canyon
- Characteristics of a quality hunting experience

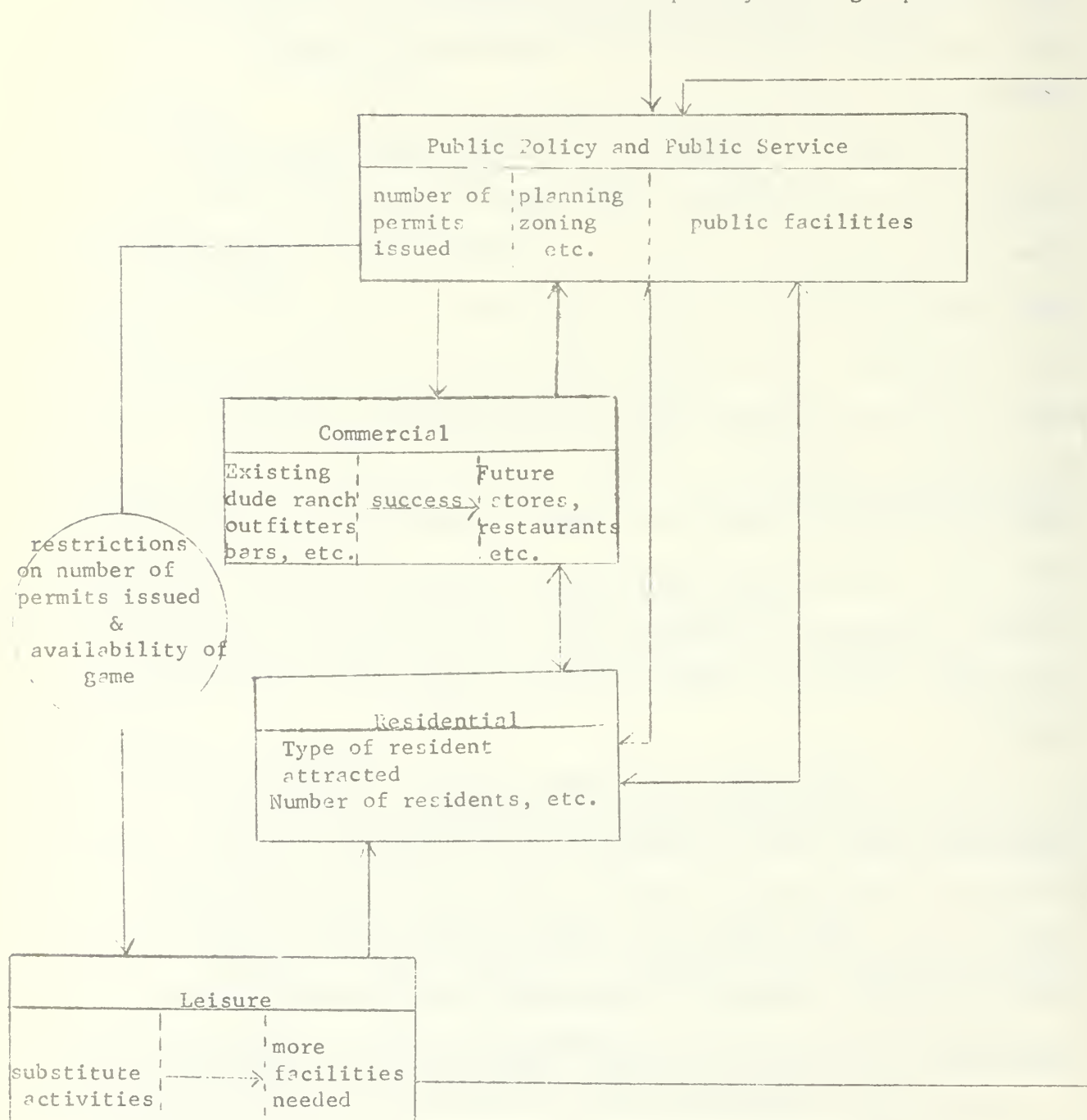


FIGURE 1

use is likely to increase. As new recreationists enter the area, commercial facilities will develop which will in turn have an impact on residential use and on public policy decisions. The attached diagram, Figure 1, offers a tentative predictive model of these generalizable inter-relationships and impacts among and between users.

The list of hunter satisfaction variables shown in Table 2 will be modified and refined in a more quantitative fashion to form a tentative hunter satisfaction index. Such an index is an example of the scales we are now developing as tools for the measurement of user preference and satisfaction. As new users enter the Canyon, we anticipate that conflict among and between users can be measured by indices such as these. During the coming year, additional data will be gathered to more accurately assess the preferences and satisfactions of various residential and recreation users in the Gallatin Canyon. Preliminary indices will be developed for further testing by the end of the 1972 field season. Such information is needed by those controlling hunting seasons and hunter concentrations, namely the State Fish and Game departments.

Preliminary data analysis indicated that permanent residents and non-resident landowners could be treated as a group and categorized by the typology shown in Figure 2.

The "preserver" category included those individuals who moved to the Canyon in search of isolation. They were opposed to any commercial development of the Canyon (including Big Sky), as well as any increase in population, or other indication of potential new commercial activity. More recently "preservers" activities have included the purchase of additional

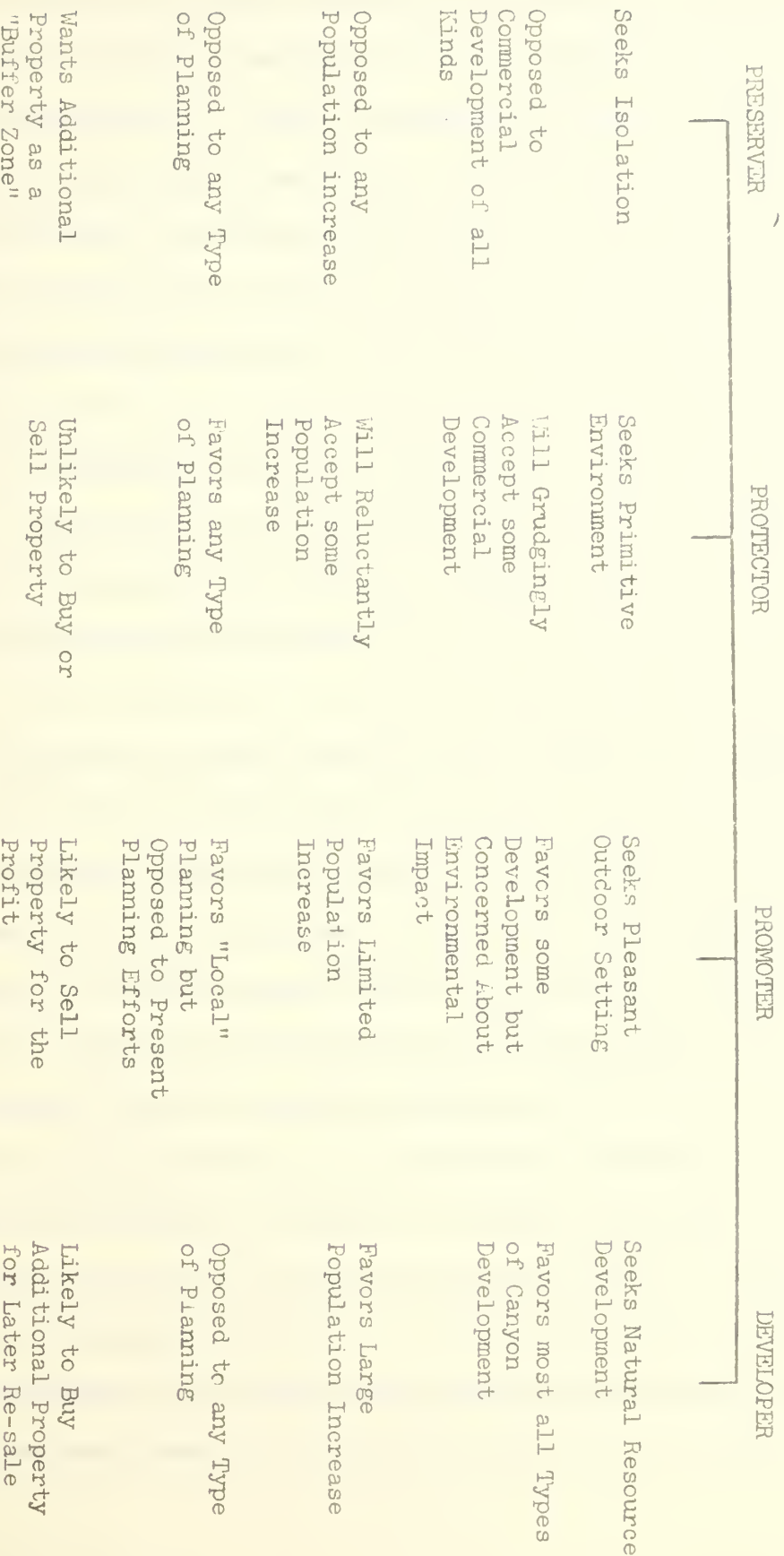
Table 2

HUNTER SATISFACTION INDEX

1. Numbers of game
2. Quality or variety of game
3. Density of hunters
4. Quality of scenery
5. Accessibility of game
6. Congeniality of hunting companions or guides and packers
7. Success in bagging game
8. Quality of weather
9. Cost of hunt for success attained (particularly relates to users of outfitters and guides)
10. Time and trips required to secure game

TYPOLOGY OF PERMANENT RESIDENTS

N = 84 Permanent
N = 24 Leaders



property to serve as a "buffer zone" surrounding their present land holdings. "Preservers" are very definitely opposed to land use planning or zoning. They regard planning as an urban artifact not needed in a rural semi-primitive setting. Their resistance to land use planning seems to be a reaction against urbanization more than against planning. This group comprised 27% of the permanent resident population. The majority of "preservers" (88%) earn less than \$10,000 per year, and 50% of them earn less than \$6,000 annually. As a group, "preservers" might be considered "senior citizens", since many (63%) are 65 or over, and 12% are less than 55 years old. Fifty percent have lived in the Canyon more than 20 years, and only 12% claim fewer than 10 years residency. "Preservers" often explain that their Canyon property has "been in the family for years", having been passed down from generation to generation.

The "protector" group moved to the Gallatin Canyon in search of a primitive environment. These residents, although philosophically opposed to commercialization of the Canyon, would grudgingly accept some degree of commercial development and increased population. The "protectors" seemed to anticipate increased recreation use of the Canyon and, with the announcement of the Chrysler Resort, seemed resigned to this development. "Protectors" indicated they would not sell their property to escape from the effects of Big Sky; likewise, "protectors" have not recently bought additional property or sold their land holdings. "Protectors" strongly favor any type of land use planning or zoning; they view planning as a tool for orderly development and use of the natural resource. "Protectors" represent 31% of the present Canyon residents and non-resident land owners. "Protectors" cannot be characterized as predominantly high or low income, since they are

fairly evenly distributed throughout the income scale--forty-four percent earn less than \$6,000 yearly, but 44% earn annual incomes in excess of \$10,000. "Protectors" are noticeably younger than their "preserver" counterparts; all "protectors" are younger than 65, and 63% are under 55 years old. They have varying tenure in the Canyon, with one-third having lived in the Canyon in excess of 20 years, one-third claimed residency of 10 to 20 years, and one-third indicated they were relative newcomers with less than 10 years residence.

The "promoter" typology includes those residents who went to the Canyon in search of a pleasant outdoor setting. "Promoters" favor some development of the Canyon although they indicate serious concern over the potential environmental impact. Likewise, "promoters" favor limited increase in the Canyon population. It appears that this group, which comprises 31% of the permanent residents and non-resident landowners, would be happier if the Canyon were to become more commercialized or urbanized than it has been. Although "promoters" have opposed the most recent efforts to develop a plan for the Canyon they say they are in favor of "local" planning. They view planning as a potential tool, but also regard it as a potential infringement of their rights by outside agencies. "Promoters" would support "planning" if it were a "local" activity, not subject to control by outsiders. This group of residents anticipates selling their property for an inflated price after Big Sky becomes a reality. As a group, "promoters" are the most affluent of the four types of permanent residents and non-resident landowners--75% claim incomes in excess of \$10,000, while only 9% earn less than \$6,000 annually. Like their "protector" counterparts, the majority of "promoters" (58%) are younger than 55 years old, although a small

proportion (13%) are over 65 years of age. "Promoters" can be characterized by their relatively recent ownership of Canyon property (a characteristic they share with "developers"). Fifty percent of the "promoters" have owned Canyon property less than 10 years, while only 18% indicate ownership in excess of 20 years.

The final category, 'developer', entered the Canyon in search of a natural resource for potential development. Accordingly, "developers" favor most all types of Canyon development as well as accompanying population increases. Recent land purchase activity on the part of "developers" indicates they are buying additional property for later resale. Likewise, some "developers" have already sold their land. "Developers" have taken a strong stand against any type of land use planning or land use controls. They seem to view planning as a potential threat to their plans for commercial development. Most "developers" (56%) have owned Canyon land less than 10 years, although 22% indicate ownership in excess of 20 years. "Developers" are relatively young, since only 12% are over 55 years old, and the majority (88%) are in the age range of 35 to 55 years. Compared to other permanent residents and non-resident property owners, a greater percentage of "developers" (33%) have incomes in excess of \$15,000 yearly, although a relatively larger proportion (55%) also indicate annual incomes of \$6,000-\$10,000.

Permanent resident and non-resident landowners as a group have been very active in debating the issue of planning and zoning. Because they reside in or close to the Canyon the majority of the time, permanent residents and non-resident landowners have had a very strong impact on local

decision-making. Analysis of the local leadership structure indicates that of 27 local leaders, 24 were permanent Canyon residents; none were non-resident landowners, and 3 were summer residents. Although non-resident landowners have not had an impact on issue resolution at this time, a number of them are potential decision makers. Of the 27 local leaders, 17 oppose present efforts to develop a land use plan for the Canyon, 7 favor land use planning efforts, and 3 have not taken definite stands. It is evident that, although the majority (78%) of Gallatin Canyon landowners are philosophically in favor of planning, the very active "anti-planning" leaders have successfully stalled planning efforts since 1970. Additional monitoring of leadership activities, in collaboration with political scientists is planned.

At the time these data were collected substantial impact from outside agencies and decision-making groups had not been felt in the Canyon. We anticipate that Federal and State decision-makers, as well as the Chrysler Realty Corporation, Burlington-Northern Railroad, and other large property owners will have a profound impact on issue resolution in the future. Likewise, as the permanent resident population of the Canyon grows, the categories of resident types will undoubtedly change. We anticipate that the "preserver" and "protector" categories will decline in size and the "promoter" and "developer" types will gain in number. Likewise, new categories of residents, not currently found in the Canyon, will immigrate to the area in search of the residential and recreational activities associated with the Big Sky resort. Changes in the characteristics of the resident population will have a profound impact on user demands which should have significant implications for other similar resort developments.

Summer residents. The 108 summer residents of the Gallatin Canyon

were categorized according to the typology shown in Figure 3. It should be noted that, for the most part, summer residents did not appear to have strongly held opinions regarding commercial development and population change in the Gallatin Canyon. Their attitudes seemed to be less polarized, and were generally more moderately held than permanent residents' attitudes.

The "cosmopolitan" summer resident strongly favored Big Sky and the anticipated growth (commercial and population) it will bring. They anticipated using the Big Sky facilities once they are constructed. Cosmopolitans were relatively affluent, since only 20% earned less than \$6,000 annually, while almost half (40%) had yearly incomes in excess of \$15,000. As a group, they tended to be older (30% were over 55 and none were younger than 35 years old), although the majority (50%) were aged 35-55. This category of summer residents can be characterized as relative newcomers to the Canyon, having resided there usually less than five years. Typically "cosmopolitans" maintained their permanent residences elsewhere in Montana, and resided in the Gallatin Canyon for six weeks or more each summer. They expressed moderately favorable attitudes toward land use planning although they had not been actively involved in the controversy revolving around current planning activities. Thirty-three percent of the Canyon summer residents were classified as "cosmopolitans".

The "transitional" summer residents comprised 15% of the sample. This group was moderately opposed to Big Sky as well as the potential commercialization and increased population it promised to bring. "Transitionals" were fairly evenly distributed throughout the various income

SUMMER RESIDENTS

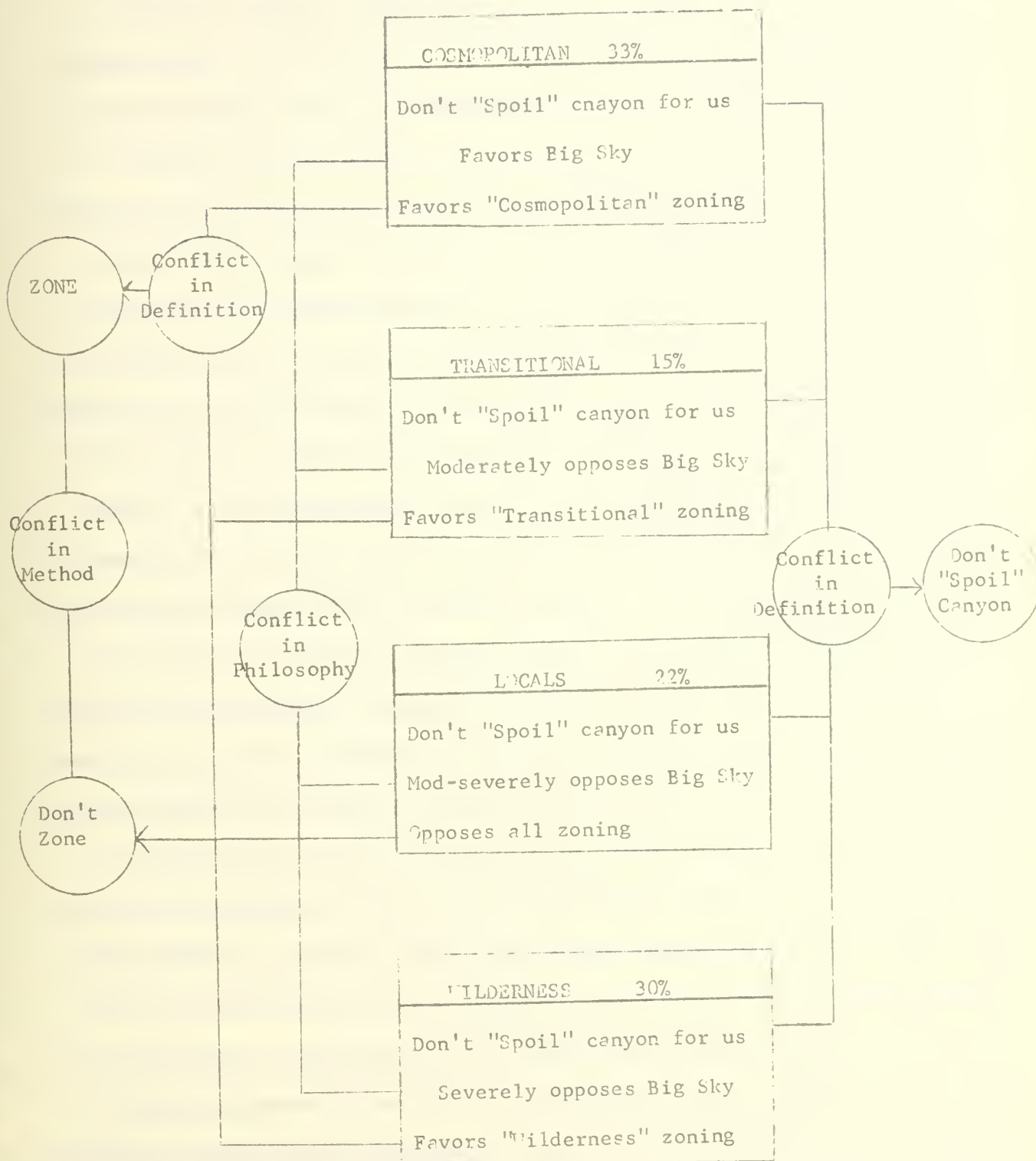


FIGURE 3

categories, although none earned less than \$6,000 annually. Likewise, they were fairly representative of the various age categories, with the greatest percentage (43%) 55 to 65 years old. Compared to other summer residents "transitionals" were under-represented in the 65 and over age group (14%), but over-represented in the under 35 age category (14%).

"Transitionals" typically resided outside of Montana, but they had maintained summer homes in the Gallatin Canyon for 15 years or longer. Their summer stay averaged 3 to 4 weeks each year. Although "transitionals" indicated moderate opposition to Big Sky, they likewise anticipated using the Big Sky facilities. "Transitionals" obviously held conflicting opinions and attitudes regarding commercialization and urbanization of the Gallatin Canyon. They expressed moderately favorable attitudes toward land use planning although generally they had not been actively involved in the controversy surrounding current planning activities. They were labeled, "transitional", because they held attitudes characteristic of "cosmopolitans" as well as "locals".

Twenty-two percent of the summer residents were categorized as "locals". As a rule "locals" were moderately opposed to Big Sky as well as the increased population and commercialization it would bring. Unlike their summer resident counterparts, 50% of the "locals" were over age 65, while only 25% were younger than 55 years old. Compared to other summer residents, "locals" had very small incomes--none earned more than \$10,000 annually, and 24% reported yearly incomes of less than \$6,000. Typically, they did not expect to use the Big Sky facilities, primarily, because they believed the cost would be too high. The majority of the "locals" (50%) maintained permanent residences in Gallatin County (usually Bozeman). Most had owned a summer home in the Canyon in excess of 20 years, and none were relative new comers of less than ten years

residence. During the summer "locals" stayed in the canyon an average of six weeks or more. In contrast to other summer residents they could be characterized by their moderate to severe opposition to land use planning. They viewed planning as an urban artifact and an activity not appropriate to rural semi-primitive areas. "Locals", however, had not been actively involved in the controversy surrounding planning activity in the Canyon.

The "wilderness" group represented 30% of the summer Canyon residents. This group was strongly opposed to Big Sky, particularly the urbanization and increased population likely to accompany the resort development. The "wilderness" group contained the greatest proportion of out-of-staters (64%) and the largest percentage of high income residents (61% reported incomes in excess of \$15,000 annually). As a group, "wilderness" residents might be characterized as "middle age", since none were younger than 35, and the largest proportion (62%) were 35-55 years old. One-half of the "wilderness" residents were relative newcomers of less than ten years Canyon residence, and the vast majority (64%) generally visited the Canyon in excess of six weeks each summer. "Wilderness" residents did not anticipate using the Big Sky facilities since they generally were seeking a primitive or semi-primitive recreation experience not compatible with resort developments such as Big Sky. "Wilderness" residents were strongly in favor of land use planning and a few (23%) had been moderately involved in the present planning controversy. Because "wilderness" persons resided in the Canyon only during the summer months, however, such involvement had been relatively limited.

We anticipate that as the Big Sky Resort develops, present summer residents will either move to other semi-primitive areas, or adapt their values and attitudes to the changing Canyon situation. Because the "wilderness"

residents have strongly identified with and personalized the Canyon, we anticipate adaptation will be the predominate change. "Local" summer residents are the most likely to disappear. We anticipate that this group will eventually sell their summer homes and cease using the Gallatin Canyon. More than likely, they will search out other local areas with features similar to the Gallatin Canyon. The "transitional" residents are likely to adapt to changing conditions in the Canyon while the "cosmopolitan" typology is likely to increase in numbers. We anticipate that new typologies, with "life styles" more oriented to commercial and urban development of semi-primitive areas, will probably emerge as the Canyon population increases.

The four typologies presented above are useful in describing the current differences of opinion regarding the use of the Gallatin Canyon. Each typology expressed the attitude that they did not want the Canyon to be "spoiled". However, after examining in greater depth what these individuals meant by "spoiling", we learned that each resident "type" had something different in mind. For the "wilderness" group, spoiling the Canyon included building Big Sky or other similar commercial facilities. For the "local" group, spoiling the Canyon oftentimes meant increasing the financial cost of using the Canyon resources. For the "transitional" group, and for the "cosmopolitan" group, spoiling the Canyon often meant limiting the number of services and facilities available or barring resorts such as Big Sky.

The "local" residents are opposed to land use planning. The "cosmopolitan", "transitional", and "wilderness" residents express favorable attitudes toward planning, although each has something different in mind

when they think of land use planning. Likewise, philosophical differences among summer residents were quite obvious - each group had definite, identifiable attitudes regarding the "best" natural resource allocations and uses. These potential areas of conflict will undoubtedly emerge as issues are debated by the Canyon population. The attached figure (Figure 3) illustrates three notable areas of conflict among summer residents.

Issue Resolution. The typologies of summer and permanent Canyon residents are useful in analyzing the results of efforts to develop a land use plan for the Canyon. Although the majority of all Canyon property owners (76%) favored land use planning, in the two years since plans for the Big Sky Resort Complex were publically announced, efforts to develop a plan for the Canyon had not been successful. The attached diagram (Figure 4) depicts the summer and permanent resident typologies and their positions on the issue of land use planning. Eighty-one percent of the summer residents and 58% of the permanent residents said they were in favor of planning. However, the permanent residents categorized as "promoters", although philosophically in favor of planning, were opposed to present efforts to develop a plan for the area. They were in favor of planning if it were accomplished by local Canyon residents, but were opposed to planning initiated by outside agencies. Current planning efforts were initiated by the State of Montana and carried out by a California consulting firm. Because summer residents had had less influence and involvement in the planning process, permanent residents who were opposed to land use planning (even though a minority of the property owners), had successfully stalled planning efforts at this writing. In fact, of 27 local leaders identified, 24 were permanent residents and 3 were summer residents. One-third of the leaders (all permanent residents) were against

ATTITUDES TOWARD PLANNING

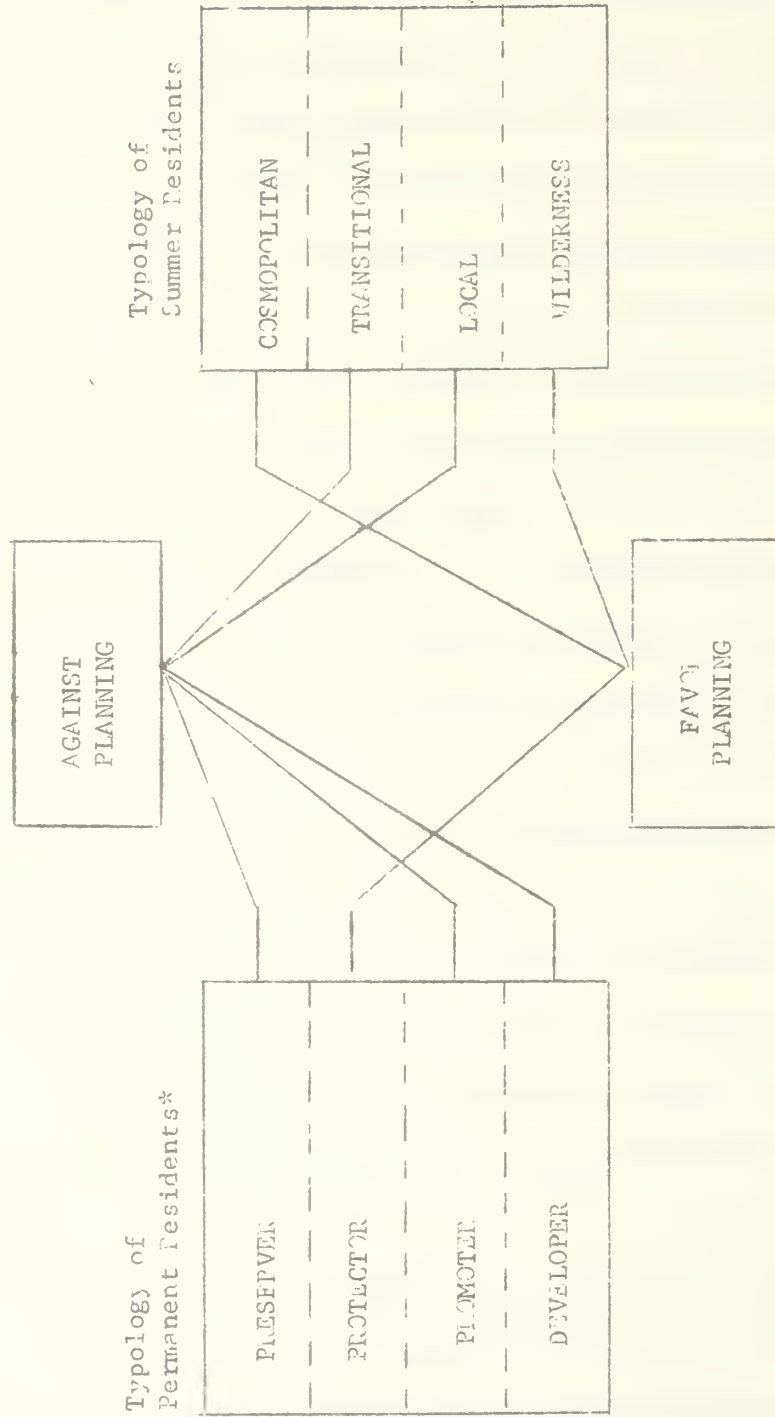


FIGURE 4

* Includes Non-Resident Land Owners

planning. It was apparent that these 9 leaders whom we identified as developers or promoters, had sufficient power and influence to stall planning for over two years.

The attitude of those individuals who opposed planning and zoning seemed fairly characteristic of a more generalized attitude observable locally that residents objected to outsiders interfering in local affairs. In the case of planning and zoning, this objection was against the State Department of Planning, the State of Montana, and federal agencies who seemed to be attempting to impose their will on local Canyon affairs. In fact, in the Fall of 1971, county-wide planning and zoning was defeated by petition of more than 60 percent of the Gallatin County property owners. At this writing, it does not seem likely that local property owners will initiate or follow-through on developing a land use plan for the county, or for the Gallatin Canyon. In view of this, serious misuse of Canyon land can be anticipated, which may in turn facilitate direct planning action.

Big Sky of Montana obviously has a considerable financial investment in the resort complex and it is our opinion they will use their powers to implement land use planning in the Canyon. We anticipate that some environmental misuses will probably occur, Big Sky and other concerned property owners will then take action, and eventually a land use plan will be developed for the Canyon. We anticipate that as new residents enter the area and as outside agencies (such as the U.S. Forest Service, Montana State Department of Planning, and Montana State Fish and Game Department) begin to exert their influence, new leaders will emerge and the balance of power, as described above, will change. As these changes occur, a land use plan will probably be developed for the Gallatin Canyon.

Alternatives to land use planning might be suggested and accepted by Canyon residents. For example, research indicates that the vast majority of Canyon residents and property owners are seriously concerned about the heavy traffic on U.S. Highway 191. Objections seem to be directed particularly at the truck traffic which travels through the Canyon. A proposal to designate U.S. Highway 191 as a "scenic highway", thus eliminating truck traffic from the area, and at the same time allowing for preservation of the "scenic corridor" by way of a highway easement, might be a land use strategy acceptable to Canyon residents. There may be other land use alternatives as well which would be acceptable to Canyon residents. Efforts to investigate alternative land use planning strategies should prove to be socially relevant and of immediate utility to Canyon planners as well as other recreation planners.

These issues are very directly related to the manner in which public and private influentials, decision-makers, and agencies, react in the face of conflict uncertainty regarding issue resolution. Information concerning how present private and public influentials handle issues involving environmental impacts is critical to understanding and assessing the political systems' performance and reaction to environmental change. Using the Chrysler Resort Complex as the principal initial focus, greater understanding of the interactions of public and private decision-makers and institutions is essential if environmental issues and public decision processes are to be clarified. By describing-analyzing the events associated with the Chrysler Resort Complex, basic knowledge will be gathered concerning the ways in which public and private decision-makers use environmental science data. The research plan will include the following objectives:

- (1) Intensive case study of events and decisions as they relate to the Big Sky recreational development.
 - a. Among the major issues and processes to be analyzed are:
 - 1) land exchanges
 - 2) liquor license laws
 - 3) labor relations
 - 4) planning
 - 5) transportation
 - 6) canyon resource re-allocations
- (2) Analysis of case study data to examine the uses to which environmental science data is put.
 - a. Among the major questions to be explored will be:
 - 1) What kinds of environmental science data are being collected-monitored?
 - 2) What individuals-groups are using these data and for what purposes?
 - 3) What relationship, if any, exists between data producers and data consumers?
 - 4) How have public and private decision-makers used the data?
 - 5) How do public and private decision-makers treat data as it relates to the assimilative capacity of a given ecosystem?
 - 6) What kinds of powers, if any, does the state now have to act on environmental issues?
 - 7) What kinds of changes are needed, if any, if the state is going to have the potential to act on environmental issues?
- (3) Using the data provided by the analysis of the Big Sky development, begin work on a conceptual model, relating in a more analytical way the relationships between actors, processes, and power in the context of conflict surrounding environmental issues.

Information input from this phase of the project to governmental agencies, citizen groups, and private concerns has been considerable. At the governmental level this has included the U.S. Forest Service, U.S. Soil Conservation Service, the Governor of the State of Montana, the Montana State Department of Planning and Economic Development, the Montana State Fish and Game Department, Gallatin County Commissioners, Bozeman City Commissioners, and Bozeman-Gallatin City-County Planning Board. The following citizen groups have requested such information: Gallatin Canyon Property Owners

Association, Bozeman Chamber of Commerce and the National Forest Preservation Group. Big Sky of Montana Incorporated, Northern Testing of Great Falls, Montana, and Thomas, Dean and Hoskins, Great Falls, Montana have also requested and received information. In addition, along with other data, information was requested and incorporated into reports by the U.S. Forest Service, Final Environmental Statement on Gallatin Exchanges Nos. 2 and 3, Gallatin National Forest; State of Montana Department of Highways, Draft Environmental Statement, Administrative Action for Project F-20(1) U.S. 191 Spur; and to The Murray-McCormick Environmental Group, Sacramento, California, as a basis for the Environmental Resource Survey and Implications Analysis for the Gallatin Canyon Planning Study.

The typologies of Canyon property owners are also useful in hypothesizing how future Canyon issues will be resolved. For example, there has been considerable discussion regarding the possibility of building a road across the mountains to the town of Ennis in Madison County (west of the Big Sky recreation site). We have hypothesized that present permanent and summer residents would assume the following stands on this issue: The permanent resident "promoters and developers" and the summer resident "cosmopolitans" will be in favor of building such a road. Together, these three groups represent 36% of the total current property owners. Among the summer residents, the "transitional", "local", and "wilderness" groups will oppose building the road, as well as the permanent resident "preservers", and "protectors". Together, these five types comprise 64% of the present Canyon property owners. If the decision on building the road to Ennis were delayed until the present composition of the Canyon had changed substantially, the anticipated influx of "cosmopolitan", "promoter", and "developer"

residents would significantly change the balance of power, and the majority of Canyon property owners would favor such a road.

Baseline attitudinal measures of Gallatin Canyon residents and recreationists provide ideal data for construction of a tentative environmental concern scale and action scales. During the 1970 and 1971 field periods, we discovered only moderate concern on the part of Canyon users regarding the environmental impact of increased Canyon population. We anticipate that as new recreationists and residents enter the Canyon, environmental concern will become more apparent. Among permanent residents, the "preserver" and "protector" types will most likely be among the first to express serious environmental concern over the potential impact of new users in the Canyon. Likewise, the "wilderness" summer residents are most likely to express environmental concern. We are interested particularly in measuring the point at which environmental concern is expressed by public action. Experimental work by the Tahoe Study Group provides some interesting scales from which we might begin our work. Tentative environmental concern (Table 3) and action scales (Table 4) are presently in the development stage.

The 1972 field season will provide an opportunity to gather additional data to test the theories posited above as well as to more adequately develop a generalizable model of user or recreation succession. We have hypothesized that certain residential and recreation users will be displaced as new residents and recreationists enter the area. The rate of displacement and the rationale offered for leaving the area will provide valuable data for further development of our theory of recreation succession. Policy makers such as the Forest Service, National Park Service, Bureau of Land Management, Bureau

Table 3

ENVIRONMENTAL CONCERN SCALE

Attitudes regarding seriousness of present (and expected) levels of:

- 1) Noise pollution (traffic noise, etc.)
- 2) Soil erosion
- 3) Visual pollution (number of ugly buildings, clearcuts, etc.)
- 4) Vegetative cover
- 5) Water Quality
- 6) Air Quality
- 7) Litter
- 8) Wildlife resources (number of elk, etc.)
- 9) Recreational facility development
- 10) Population density
- 11) Automobile traffic
- 12) Logging

Table 4

TENTATIVE ENVIRONMENTAL ACTION SCALE

1. Membership in a local, state or national environmental action group
2. Attendance at local, state or national environmental action meetings
3. Holding elective office in environmental action organizations
4. Membership in an ad hoc environmental action group
5. Active support in formation of planning and zoning district
6. Writing letters, giving talks, etc. favoring environmental preservation actions

of Outdoor Recreation and Montana Fish and Game Department should then be better prepared to consider the impact of policy decisions on user groups. As research continues, we should also be able to measure the relationship between the varieties of user groups and their impact on the natural physical environment. Further analyses of these relationships will provide a useful tool for anticipating environmental impacts in similar recreation areas.

During the 1971 field season we began interviewing campers in the Gallatin Canyon, as well as hunters who entered the area during the 1971-72 season. Because the hunting season ended only recently (February, 1972), these data have not yet been adequately analyzed. However, field work for the study of campers was completed in September 1971, and preliminary results are now available.

Using semi-structured interviewing techniques, 60 campers were contacted during the summer of 1971. Due to inadequate responses or lack of data, six interviews were discarded.

We have hypothesized that the type of individuals who now camp in the Canyon will change as the Big Sky resort develops. Therefore, efforts to identify the present behavioral, attitudinal, and socio-economic characteristics of Canyon campers seemed of primary importance.

Analysis of the data indicates that campers can be placed on a continuum of "comfort orientation" (Figure 5). At one end of the continuum we identified a group of campers whom we described as "satisfied rough-it" campers. This group represented 4% of the sample and was characterized by their tendency to camp in primitive campsites, using a minimum of camping facilities and equipment. These campers indicated that in their opinion, "roughing it" was a desirable way of camping, and they had no desire for more sophisti-

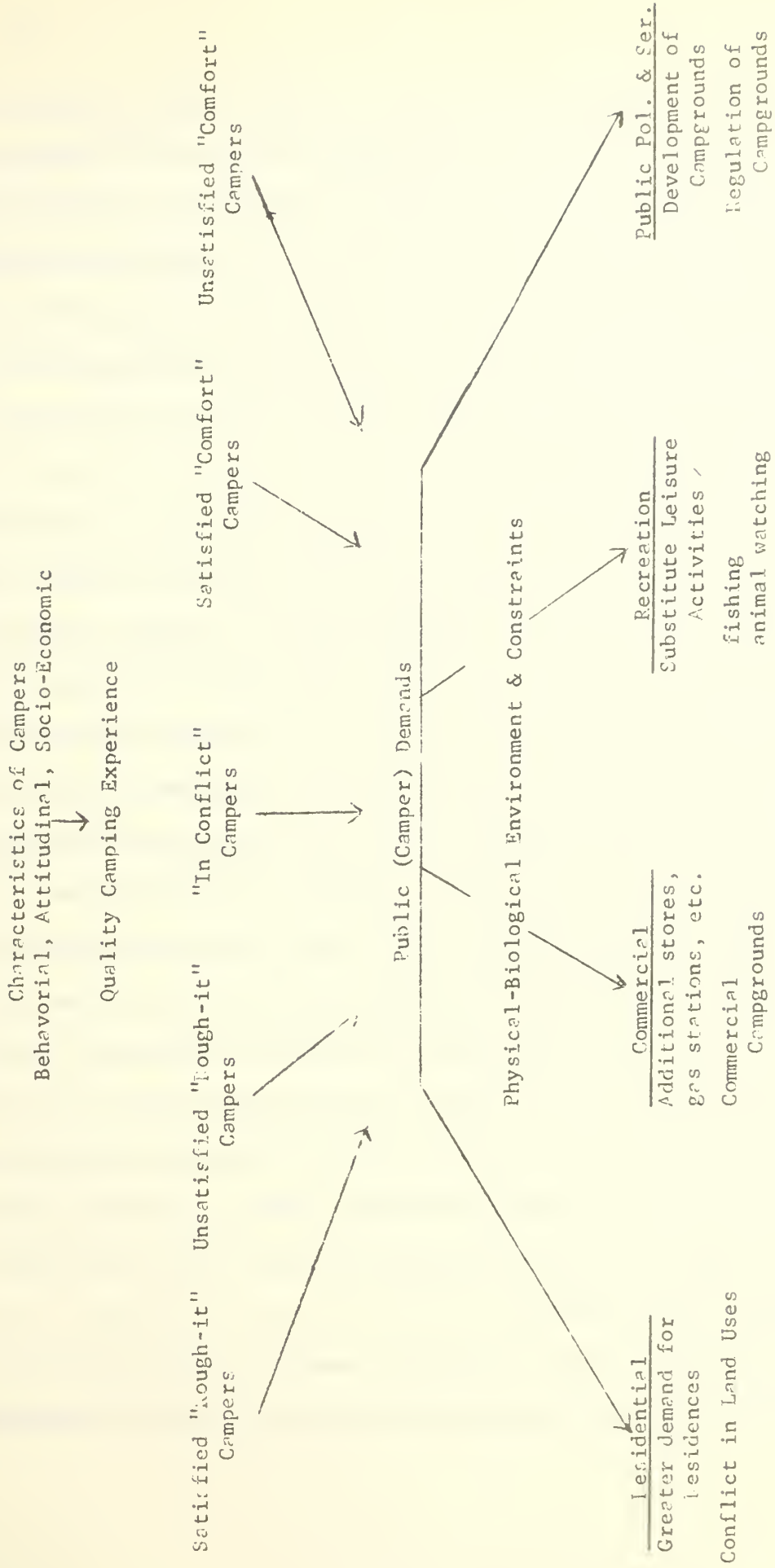


FIGURE 5

cated camping equipment or facilities. Likewise, they were opposed to commercialization of the Canyon (including Big Sky) and the increased population which normally accompanies commercial development. Although only two campers were identified as "satisfied rough-it", both were under 30 years old, one was still in high school and the other was a college student. We would expect that "roughing-it" is very likely an age related activity, and other "satisfied rough-it" campers would be likely to fall in the younger age categories.

Thirty-nine percent of the campers were categorized as 'unsatisfied rough-it campers.' These individuals were found camping in sites similar to those in which we found the "satisfied rough-it" campers. Although "unsatisfied rough-it" campers also used somewhat primitive camping equipment, they indicated a preference for more sophisticated equipment, as well as more developed campsites with facilities like running water and flush toilets. In other words, they were roughing it but were not satisfied with this type of camping experience. Although "unsatisfied rough-it" campers were fairly evenly distributed throughout the income scale, as a group, they were less affluent than their counterparts on the "comfort continuum". These campers were generally opposed to commercial development of the Canyon as well as the associated population increases. As a group, they were slightly older than their "satisfied rough-it" counterparts, but substantially younger than the other campers, since the majority (76%) of "unsatisfied rough-it" campers were under 50 years of age, and a fair proportion (38%) were under 30.

A third type of camper, 'in-conflict campers', represented 18% of the sample. They indicated a desire for many of the comforts like running water,

chopped firewood, and flush toilets, but also indicated that they came to the Canyon in search of a primitive experience. "In-conflict campers" were generally opposed to commercial recreation development in the Canyon, even though they indicated a desire for many of the services and facilities associated with commercial recreation areas. They were identified as "in-conflict" for this reason and because they realized that improving the campsite and adding more development to the area would alter the "primitiveness" of the experience they sought. As a group, "in-conflict campers" were the most affluent of the Canyon campers - eighty percent had yearly incomes in excess of \$15,000 and none earned less than \$10,000 annually. They were evenly distributed throughout the age brackets, with the majority (70%) falling between 30 and 60 years old.

A fourth group of campers, representing 33% of the sample, were found camping in the more developed campsites. Because they generally utilized more sophisticated camping equipment, the more developed campsites, and also indicated no desire for more convenience facilities, they were identified as "satisfied comfort campers". As a group, they had more favorable attitudes toward commercial recreation development in the Canyon, and accepted Big Sky and the associated side effects. "Satisfied comfort campers" were predominantly older than their "rough-it" counterparts, and might be characterized as relatively "old", since none were under 30 years old, 73% exceeded 55 years, and 34% were older than 60. The majority (51%) also had incomes in excess of \$15,000 yearly, and none earned annual incomes less than \$10,000. Although not as affluent as the "conflict campers", they did represent a great deal more wealth than the "rough-it" campers.

A fifth type of camper, identified as "unsatisfied comfort campers",

composed 6% of the sample. They were found in the more developed campsites, and using the more sophisticated camping facilities and equipment, but at the same time, indicated dissatisfaction with their camping experience. "Unsatisfied comfort campers" were by far the "oldest" group of Canyon campers--67% were over 60 years of age, and none were under 30. They were also a relatively affluent group, since the majority (67%) had annual incomes exceeding \$15,000, and none earned less than \$10,000 yearly. As a group, their incomes were second only to the "in-conflict campers". In general they favored commercial development of the Canyon, and were particularly supportive of the proposed Big Sky resort. "Unsatisfied comfort campers seemed to be in search of an outdoor experience with all the comforts of home, and would probably have preferred staying in a hotel or motel rather than a campground.

We have hypothesized that as the Big Sky resort develops, the proportion of "comfort oriented" campers will increase substantially in comparison to the number of "rough-it" campers. As this change occurs, we anticipate that public (camper) demands will require development of more comfort oriented camping facilities. These new demands have a potential for generating increased residential, commercial, and recreation use conflicts in the Gallatin Canyon area. Public policies and decisions concerning natural resources uses will undoubtedly be unpopular with a few of the user groups, since the public will be making conflicting demands. Our present somewhat subjective camper continuum approach will be quantified further and refined to provide more validity and transferability to campers in other areas and in relationship to other recreational activities. For example, the study of campers has revealed that the majority (69%) were

also avid fishermen. In collaboration with other studies, fishermen harvest, fishermen preference and fishermen expenditures are being analyzed and it will be possible to produce a generalized model of fishermen-camper behavior with the assistance of the systems personnel.

Such information is greatly needed by agencies such as the U.S. Forest Service, U.S. National Park Service, Bureau of Land Management, Bureau of Outdoor Recreation, and the Montana Department of Parks.

We shall also examine national trends and compare these with what we are observing in the Gallatin Canyon.

A major study was directed toward the effects of camper use on two major established U.S. Forest Service campgrounds: Greek Creek and Spire Rock. These two sites are similar in that they are located on the Bigel-Hobacker Soil Association. This association is almost continuous from the mouth of the Gallatin Canyon to the Yellowstone Park boundary. The soils are formed from alluvium and occupy stream terraces and fans adjacent to the Gallatin River and its main tributaries. This association, being along the river and the highway is used intensively for picknicing, camping, fishing access and as base headquarters for horseback riding, hiking, hunting, snowmobiling and other recreational uses. The majority of residential development in the canyon area, dude ranches and business establishments are built on this soil association. Approximately 25% (2,200 acres) of the association, namely the Bigel Soil series, is suitable for campgrounds. Therefore considerable generalization is possible between the two campgrounds studied and other campgrounds in the canyon.

Greek Creek campground has 14 campsite units and is located on both sides of Highway 191 near the mouth of Greek Creek. Spire Rock contains 15

campsite units and six picnic facilities. It is also at a more remote site being located beside Squaw Creek on a graveled spur road four miles from Highway 191. The two campgrounds are dissimilar as to ease of access and type of use.

The areas immediate to the physical facilities are severely trampled. The highest measured density of 0.25 acres per individual campsite was observed in a portion of the Greek Creek campground. Campsites 1 through 7 at Spire Rock had an average of 1.32 acres per campsite.

Two independent observers made estimates of the ground cover in circular areas ranging from 20 to 60 feet in diameter around the individual campsites. In these areas, 57 to 99 percent consisted of bare ground and litter. Living ground cover ranged from 1 to 43%. The intolerance of indigenous species to the traffic level around the individual campsite areas was obvious. The prevalent limited vegetation consisted of annual grasses and low growing legumes that are not native to the plant community. The frequency of occurrence of these species appeared to be associated with the intensity and duration of shading by the tree canopy.

Estimates were made of the intensity of tree shade and the percentage of daylight hours of shade in each campsite as related to percentage coverage by base soil plus litter (Figures 6 and 7). It is apparent that it will be difficult to maintain any appreciable living plants as ground cover in areas that are shaded over 50 percent of the time.

The foregoing observations strongly suggest that it would be futile to limit visitor use in intensively used campgrounds to a level that would permit survival of the native plant community. If one accept this reality

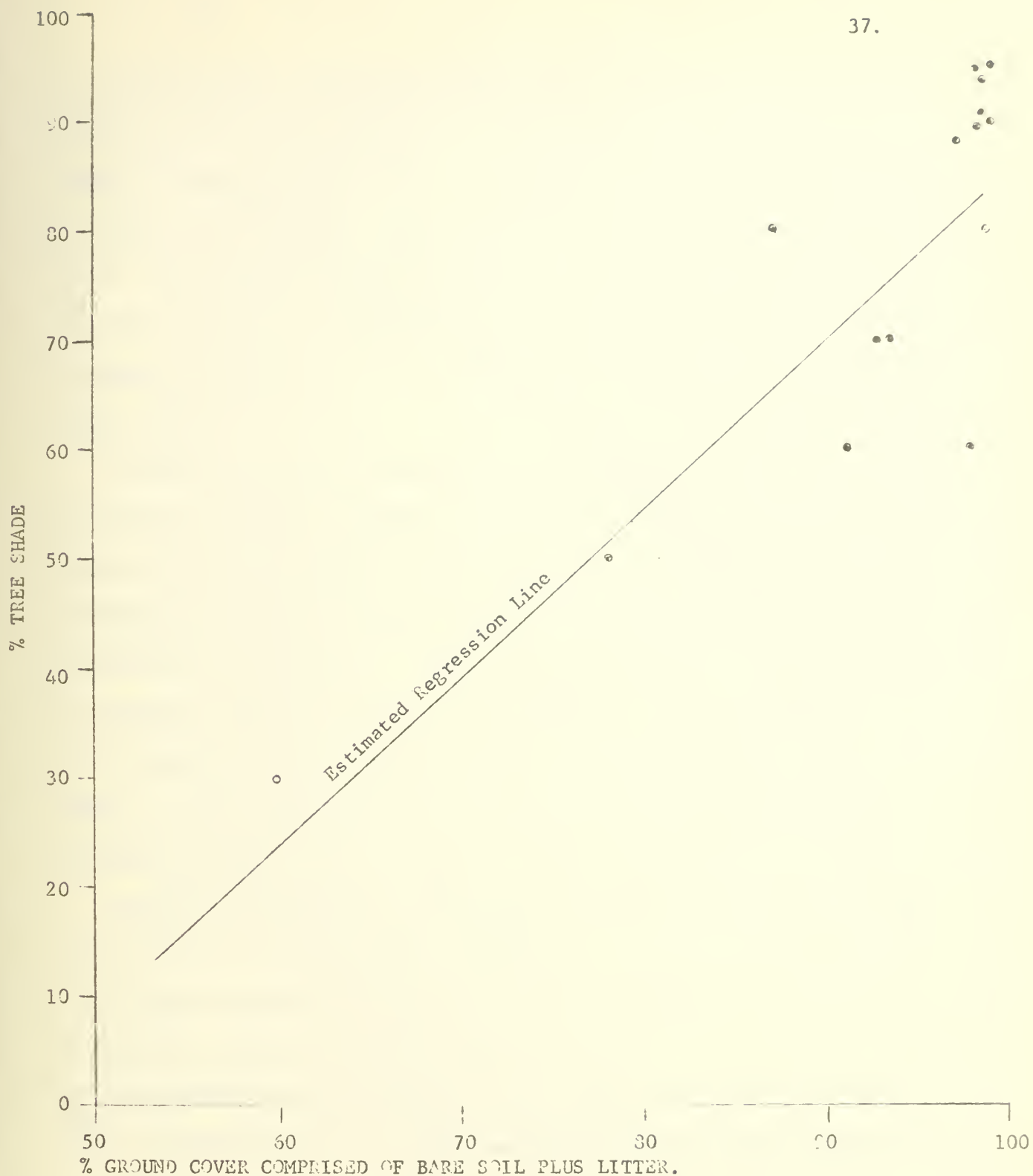


FIGURE 6: Relationship between percentage of total ground cover comprised of bare soil and litter, and percentage of tree shade in Spire Rock campground.

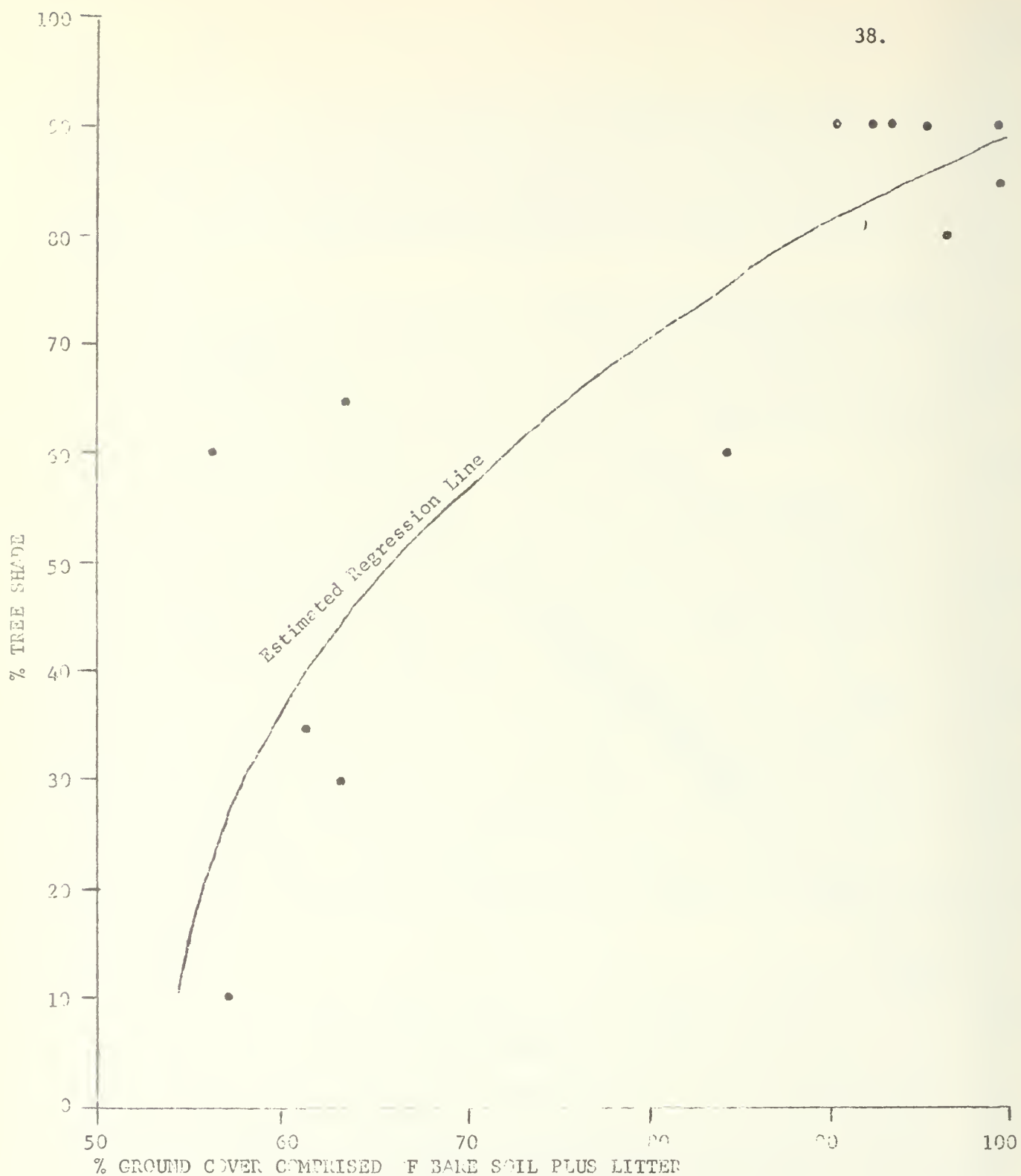


FIGURE 7: Relationship between percentage of total ground cover comprised of bare soil and litter, and percentage of tree shade in Greek Creek campground.

it is apparent that camping as a recreational activity as it is now being carried on has already resulted in a deterioration of the Gallatin Canyon. Present and future impact of this recreational activity on the environment will depend upon the total land area allocated to this use and the intensity of use. The survival of native plant cover will depend upon the extent of open space that is not occupied by access roads, parking stalls, sanitary facilities, garbage cans and the trampled areas around the individual campsite units.

In order to provide an estimate of the area of relatively untrampled open space at different campsite unit densities, ratios were calculated between the areas of intensive human and vehicle use and the relatively untrampled open spaces at Spire Rock Units 1 through 7 and Greek Creek east and west of Highway 191. Using these calculations as reference points, an estimated regression line was drawn comparing total acres/campsite with acres of native vegetative ground cover per unit campsite (Figure 8). As an example, if the allocation of 1.32 acres per campsite at Spire Rock was considered optimal then 1.20 acres with native vegetative cover would result.

Assuming the ownership of 220 acres of forested Bigel-Hobacker Soils is proportional to the percentage ownership of land by the Forest Service (71.6%) then a maximum of 1573 acres would be available for campground development assuming 1.32 acres/campsite as optimal. If completely developed into campgrounds then 1191 campsite units could be constructed. This of course is ridiculous since it would convert the entire edge of Highway 191 within Forest Service property, into campground scenery. If we consider the present and projected number of campsites in the Canyon on Forest Service land which total 115 (Spire Rock - 15 units, Greek Creek 14 units, Swan Creek

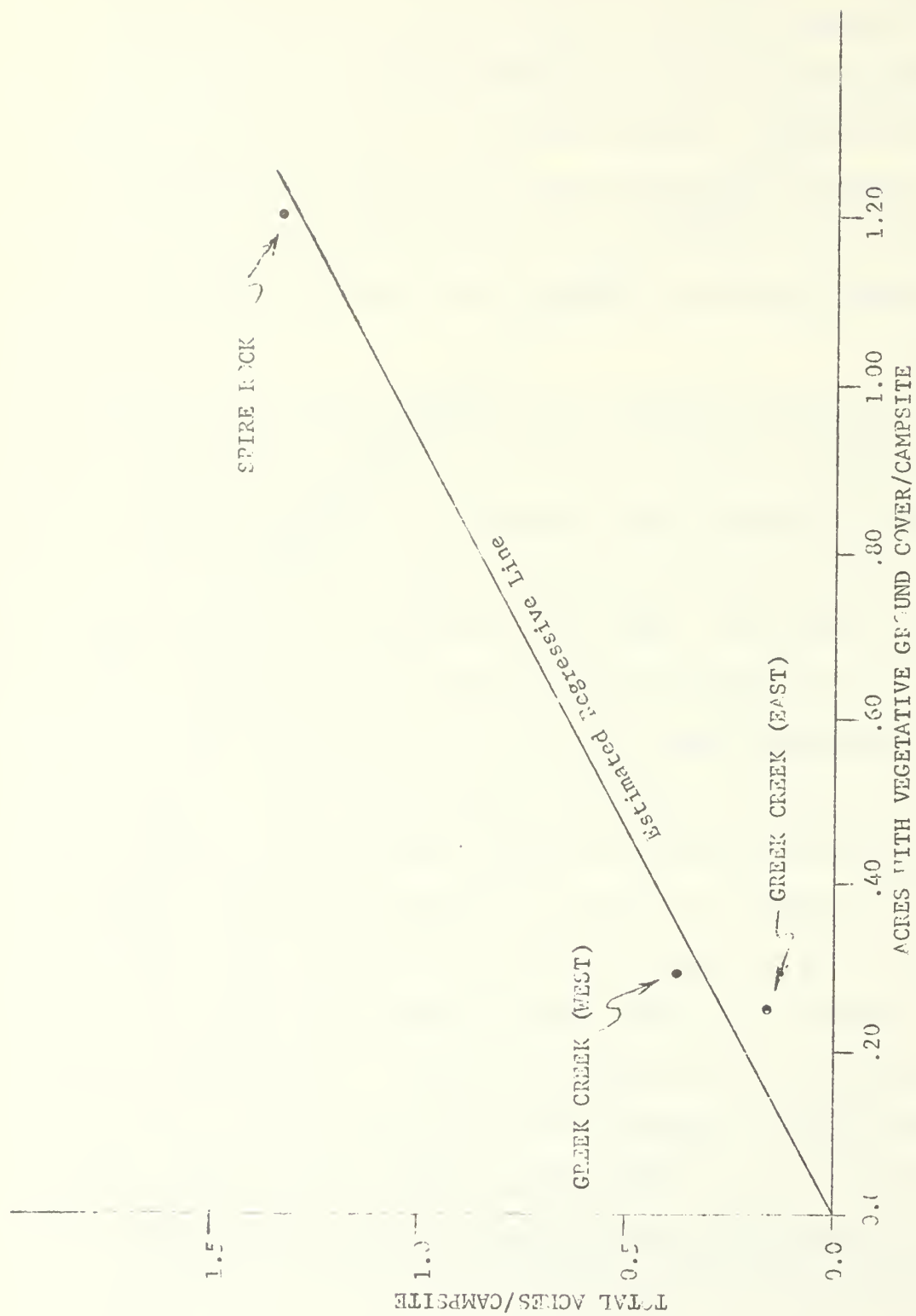


FIGURE 3: Relationship of total area per campsite to specific area uses in Greek Creek campground (West & East) and Spire Rock campground.

11 units, Red Cliff 75) and assume that they had all been designed with 1.32 acres/campsite the total would be 152 acres of land occupied by campsites. This would account for 9.7 percent of suitable land for campsites which also seems intolerably high when one considers that much of this land is occupied by Forest Service Administrative structures, summer home lessees, Forest access roads, and some of the area is unsuited for campgrounds for various reasons.

However, according to data furnished to us by the U. S. Forest Service trends in camping activities are suggested that may indicate the desirability of a policy shift in public campground regulation and construction in the future. The percentage activity of visitors in Spire Rock and Greek Creek campgrounds are particularly significant in this respect and are compared in Table 4 for 1966 versus 1970.

Table 5

Camping Activities in Spire Rock and Greek Creek Campgrounds by Visitor Days and Percentage Use in 1966 and 1970 (United States Forest Service Data).

Activity	Spire Rock		Greek Creek		Spire Rock		Greek Creek	
	Visitor	%	Visitor	%	Visitor	%	Visitor	%
	Days	Use	Days	Use	Days	Use	Days	Use
Picnicking	200	40.9	830	5.5	300	5.7	300	4.9
Camping - Gen.	130	26.5	7500	50.0	500	9.4	800	13.1
Camping - Auto	40	8.2	1670	11.1	500	9.4	2000	32.8
Camping - Trlr.	80	16.3	3330	22.2	100	18.9	2000	32.8
Camping - Tent	40	8.2	1670	11.1	3000	56.6	1000	16.4
Total	490	100.0	15000	100.0	5300	100.0	6100	100.0

Although the number of visitor days at Greek Creek in 1970 was only 50% of that in 1966, there was more than a ten-fold increase in visitor day use at Spire Rock.

Little significant change occurred between numbers of picnickers at both campgrounds between the two years, however there was a tremendous drop in percentage use by picnickers at Spire Rock in 1970.

Camping general is defined as camping out of a conventional auto rather than a specialized vehicle. Both in terms of absolute numbers and percentage use this activity has dropped tremendously, probably as a result of the increasing popularity of truck campers and camping vehicles. The greatest percentage drop in percentage use has been at Greek Creek. Camping auto use has increased in both areas but the greatest percentage increase has occurred at Greek Creek.

Very little change has occurred in camping trailer use at Spire Rock in spite of the ten-fold increase in use of the area. Although absolute use of these vehicles became less at Greek Creek in 1970 nevertheless the percentage use nearly doubled over 1966. The most striking change however, was the 75 fold increase in visitor day tent campers at Spire Rock and the change in percentage use between 1966 and 1970 from 8.2 to 56.6%. The increase in tent campers doubled at Greek Creek but visitor day use by tent campers at Spire Rock was triple that at Greek Creek.

As mentioned before these two campgrounds differ as to ease of access. Travelers driving along Highway 191 are more likely to use Greek Creek because of its ease of access whereas local people are more likely to use Spire Rock because of their knowledge of local camping conditions.

The intensive use of Spire Rock by tent campers fits in very well with their sociological characters and is related to their need for a unique camping experience. Including the satisfied and unsatisfied "rough-it" campers as a group (43%) they tend to camp in primitive campsites using a minimum of sophisticated equipment. Spire Rock with an average area 1.32 acres per campsite giving 1.20 acres per campsite of native ground cover seems to be appealing to this group.

In contrast 78.7% of the campers at Greek Creek are auto, camping autos, or trailer users. With an area of 0.25 acres per campsite which provides very little native understory plant cover this situation is apparently not important to them. Two groups of campers ("in-conflict", 18% "satisfied comfort campers", 33%) tend to utilize the more developed campgrounds such as Greek Creek even though the "in-conflict" campers realized that improvement of campsites would alter the primitiveness of the experiences they sought. The "unsatisfied comfort camper" (6%) would not be satisfied by any type of public campground that can be found in the canyon.

Considering all of these data several conclusions can be drawn. First of all a more expensive type of facility is required by the "comfort campers." Their needs could be met by private developers and the cost of the required facilities could easily be paid by the users. Secondly picnickers seem to be incompatible with other types of campers and sites should be developed only for their use or zones for their use in existing campgrounds should be established. Thirdly, the tent camper apparently desires a primitive site that would require little cost for development. At present, such sites are in short supply and should probably have the highest priority for future development.

A total of 2058 sample units traveling Highway 191 were interviewed from July 24 to September 16, 1971 and 443 units were interviewed during June 1971. Based on results obtained from a traffic counter provided by the Montana State Highway Department the traffic count from June 6, 1971 to October 26, 1971 was estimated to have been 271,671 units (an average of 1913/day).

Of the travel parties interviewed 54.3% declared that the purpose of their travel was pleasure. The average number of occupants per vehicle was three. Travel units staying in the canyon at least overnight amounted to 12.1% of the sample. As to the type of the previous nights lodging relating to campsite use, 14.4% camped, 5.6% were in trailers and 1.0% used an auto equipped for sleeping. The total percentage of all categories was 21.9%.

Assuming that the samples were an accurate estimate of peoples activities and the results could be applied to summer traffic even though samples were taken in 1970 and 1971 then the number of vehicles remaining overnight for a minimum of one night would be $0.121 \times 0.219 \times 1913$ which amounts to an average of 51 camping units per night containing 153 people. At the present time there are only 40 camping units available. Forest Service campsites in the canyon (Spire Rock - 15 units, Greek Creek - 14 units and Swan Creek - 11 units). Obviously, the facilities available for campers is far too low for the number of campers when one considers that statistics presented are only averages and do not reflect the much greater loading during the peak travel season in July and August. For example, the average daily traffic was 2,475 cars on an average July weekend in 1969. Based on the above assumptions this would amount to a minimum of 66 overnight

camping units with 198 people. As a result people are camping anywhere it is possible to drive off the road and also overloading the designed capacity of presently existing campgrounds thus resulting in increasing environmental damage to the area immediate to Highway 191.

The camping situation will be somewhat alleviated with the completion of the Red Cliff campground (75 units). Much of the material is on hand, however funds are not available for installation of tables and benches. Funding is also needed for water and a sewage disposal system and perhaps sufficient funds could be freed for this purpose thus adding to the benefit and enjoyment of the people.

It has been estimated that Big Sky visits will result in an additional 600 cars per day in 1980. However judging by answers given by people questioned during the NSF traffic survey, it is doubtful if this additional traffic will have any effect on campsite loadings in the immediate future. The traffic interviews revealed that 59% of the travelers had heard of the Big Sky development but when asked if the presence of Big Sky would cause them to return to the area 42.7% replied that it would and 42.5% said that it wouldn't. However, as the presence of Big Sky becomes more widely known an increasing number of campers may be attracted to the area. This type of trend is impossible to predict at present.

In order to assess future camper impact, ignoring Big Sky visitors, projections of estimated traffic through the canyon were made using our 1970 traffic count as a base line and assuming a 3% yearly increase compounded yearly. Assuming no change in the activities of the travelers an estimate of the number of overnight camping vehicles has been computed, Table 6.

Table 6

Estimated Average Daily Non-Commercial Vehicle Traffic and Numbers of Overnight Camping Use During the Summer Camping Season Disregarding the Effect of Big Sky.

Date	Travelers		Over-night Campers		Camping Sites
	Cars	People	Cars	People	
1970	1913	5739	51	153	40
1971	1970	6087	55	165	40
1972	2029	6087	55	165	40
1973	2090	6270	57	171	115
1974	2153	6459	59	177	115
1975	2217	6651	61	183	115
1976	2280	6852	63	189	115
1977	2353	7059	65	195	115
1978	2424	7272	67	201	115
1979	2497	7488	69	207	115
1980	2572	7716	71	213	115

However, these figures are daily averages and ignore peak loadings during July and August weekends and also any trend in increase of camping use as a result of Big Sky. Consequently the available camp site capacity will be greatly exceeded many times during the summer.

It is our understanding that the Forest Service presently does not contemplate any further development of public campgrounds in the vicinity of Highway 191. However, there is a possibility that the Forest Service may construct campgrounds that will be out of sight from the highway and streams but will be in the same region. It may also be necessary that some summer homes on Forest Service property may have to be eliminated.

Work plans for next year will be directed toward obtaining more information on user density on environmental factors as related to the type of user. Camper attitudes will be related to the type and sophistication of their equipment as related to the value of their camping experience. Also, the relative proportions of local, regional, and extraregional users and their origin as to urban or rural will be investigated in relationship to the camper experience attitudes.

The U. S. Forest Service, National Park Service, Bureau of Land Management, and the Bureau of Outdoor Recreation have expressed keen interest in these studies.

Future camping developments near Highway 191 are being constructed by private interests. Developers are already proceeding with such developments but in the absence of proper zoning much of this construction may not be aesthetic and the developments are likely to be on soils that are not suitable for such use. Unfortunately Highway 191 is bordered by such soil for several miles south of West Fork (Big Sky entrance).

Big Sky of Montana will probably not be engaged in such developments in the near future because of their protective covenants (sub paragraph 1) as filed with the Forest Service in the Final Environment Statement, Gallatin Exchanges 2 and 3, Gallatin National Forest. This covenant states the following: "No trailer, mobile home, basement, tent, shack, garage or camper shall be used at any time, on the premises, as a residence or sleeping unit temporarily or permanently, except where the same may reasonably be necessary during construction and never without: (a) the prior approval of the committee which is revocable at any time in its discretion and (1) never for more than seven months at a time. No trailer, boat, mobile home,

snowmobiles, shack, camper, or any structure of a temporary nature shall be permitted on the premises except under the terms of sub-paragraph 11 (a) and (b) above or unless covered, fenced or screened parking space is provided which must be approved by the committee. According to the wording of the above protective covenant it will be possible for Big Sky to develop private campgrounds in the future.

In accordance with Section 102 (2) (c) - Public Law 91-190 the State Department of Highways has issued a Draft Environmental Statement concerning a spur road from U.S. 191 near the mouth of the West Fork of the West Gallatin River and which extends up the West Fork drainage a distance of 9.7⁺ miles, to a point near the base of Lone Mountain. Construction contracts were awarded in July 1, 1971 for construction of a structure across the West Fork and three miles of gravel surfaced roadway from U.S. 191 to the Meadow Village. No federal money was involved for this construction. On August 12, 1971 the West Fork drainage was designated an Economic Growth Center and federal funds were secured making the federal-aid matching ratio 20% higher than on normal federal-aid primary projects. This will allow construction of the entire road including the 6.7⁺ miles to connect the Meadow Village and Mountain Village.

The roadway will be designed to provide a 34-foot paved surface with two 12-foot driving lanes and two five-foot shoulders. In-slopes will have 6:1 safety slopes with a minimum ditch width of 15 feet. Extensive use was made in the report of data from "The Impact of a Large Recreational Development upon a Semi-Primitive Environment: A Case Study", which is the present grant being funded to Montana State University by the RAIN Program of the National Science Foundation. Of particular importance were the studies on

our "General Soils Map and Soil Interpretations for Land Use Planning and Development in the Gallatin Canyon" and the "Surface Rock Materials of the West Fork Basin Area". Both maps and accompanying text point out and specifically locate potential hazards for road construction as well as other uses. Because of a huge slide hazard area in sections 34 and 36, T. 6S. and R. 3E, five alternate routes for the highway were selected and requests for comments were solicited from a variety of agencies. The geologist on our team will offer his expert advice to the Highway Department on this matter if requested to do so.

In the impact statement the following paragraphs appeared: "There is a possibility that this highway may eventually be extended into the Madison valley and connect with U.S. 287 near Ennis. Although an extension of the route has not been submitted to the Federal Highway Administration considerable public sentiment has been expressed supporting this possibility.

"The environmental impact of such an extension would be considerably greater than that envisioned for the Spur coming in from the Gallatin. The route would for the most part, cross forest land not presently accessible by motor vehicle. No attempt will be made in this environmental statement to evaluate the feasibility or environmental impact of this extension. A separate study and environmental statement would be required prior to any decision with regard to this possibility.

There can be no question that such a road extension would be of enormous benefit to Big Sky as a result of shortening travel time and access to Big Sky from the west. According to our preliminary studies it would also have an economic impact on Madison County and will probably change the trade pattern between Madison County and the two largest adjacent trade centers

(Bozeman and Butte).

Madison County encompasses a large area but a small population according to the 1970 census. It is located in the south-western region of the state immediately west of Gallatin County.

The most immediate impact of the road would be upon Ennis which is the important trade center for the Madison Valley. It would become immediately accessible to Big Sky if the road were constructed since it lies only 20 air miles west of Big Sky and would be located at the junction of the road with U. S. Highway 287 which runs north and south.

Madison County already is directly affected by the Big Sky Project in several ways. A portion of the development area is within the county, i.e. the Mountain Village and ski complex which will vastly increase the county tax base. The impact upon employment in Madison County could become important during and after the construction of Big Sky. The 20 mile road from the Mountain Village to Ennis would obviously intensify the economic impact. Sheridan, the largest town in the Ruby Valley, would probably be least affected since it is separated from the Madison Valley by the Tobacco Root Mountains.

The continued restoration of Virginia City, undiminishing demand for the blue ribbon trout fishing near and in the Madison Valley as well as the excellent lake fishing would become much more accessible to Big Sky guests as well as tourists using U. S. Highway 191 if the road were built. In fact, this would become a mutual interaction as a result of greatly reducing the travel time and distance between the Gallatin Canyon and the Madison Valley.

Attitudes of people in Ennis and Sheridan were sampled as to attitudes towards Big Sky, the environment and planning. There was very little

difference between the two Madison County towns in attitude towards Big Sky of Montana.

Neither is there a consensus of opinion. Large numbers of people in both towns have no opinion or have not yet decided what position to assume. However, more people appeared favorable to the development of Big Sky, or other enterprises like it than are unfavorable, based on their responses to indirect questions probing this issue.

It was quite clear that the sampled residents of Ennis and Sheridan disagree with the impact of Big Sky on Bozeman as compared to Madison County. Ennis residents feel they will share the impact with Bozeman, while Sheridan residents feel Madison County will be largely unaffected.

With regard to environmental concern the friends of the Big Sky development who approach it from an environmental viewpoint have a clear and definite rationale. A comfortable all weather road into the Spanish Peaks and Lone Mountain will make it possible for all people to enjoy the scenery. Furthermore they feel growth will come with or without planning. If Big Sky doesn't come in then a "smelly pulp mill will come in." A clean industry is preferred.

The environmental opponents of Big Sky state that the elk will be driven away, they won't reproduce and will leave the Wilderness Area because of the construction of the road. Furthermore, the fishing will be ruined for all because the spawning grounds will be inundated with fishermen. In addition there is always an undesirable element who tag along with the tourist trade. These people, the "Hippies", will be a big problem. They can be stopped by stopping tourist developments. Tourists will not come to this area if there are no facilities to attract them. Discourage "Hippies" by discouraging tourism.

As to planning, those who had the opinion that the lack of unplanned development occurring in Gallatin Canyon was the real danger to Montana also felt that Big Sky type developments represented a greater danger to the environment or at least as great a problem. In this context it is important to note that Madison County was the first in the state to adopt countywide planning. Information drawn from sources other than the data in the report suggested rather strongly that the apparently favorable attitude toward area-wide planning arises in part from learning that is taking place as a consequence of the Big Sky Development. However there are smaller recreation developments now in process or completed in Madison County that have made citizens in that area quite conscious of the inadequacies and problems of unplanned development.

As for taxes for the road there were pro and con arguments concerning the expenditure of public funds for a road into the Big Sky development.

Those who support Big Sky tend to look upon tax expenditures as an investment. "If a certain number of invested dollars will elicit a good return in new taxes directly from Big Sky, and also stimulate peripheral developments in Ennis and other parts of the country, then it is a worthy expenditure of tax funds."

Opponents also have a rational argument. "If Big Sky, as a corporation benefits and makes profits from the road then they should finance construction with their own money." "The tax money can be used other places, and taxes are too high now in any case."

In our opinion there is no doubt that the road extension over Ennis will be built sooner or later. The most likely route will be up Jack Creek to the Madison-West Fork divide. This route was also one of the major aboriginal

routes from the Madison Valley and the Gallatin Canyon and should be thoroughly examined for artifacts. The area to be traversed has never been logged, is almost completely forest covered and contains a substantial population of non-migratory elk as well as other game animals. In view of the social, economic, recreational, and environmental considerations involved a study of the area and the complex interrelationships involved, a plan to study this area should be of the highest priority in our renewal proposal.

Land exchange 2 and 3 were approved April 21, 1972 by Secretary of Agriculture Butz. In the exchanges tagged BN2 and BN3 the Forest Service received 21,749 acres of Burlington Northern land traded for 10,243 acres of Forest Service land located in the West Fork Area adjacent to Big Sky. Burlington Northern, the major stock holder in Big Sky of Montana, has indicated that it will sell 1,927 acres to Big Sky. This will be added to Big Sky's present holding of 8,720 acres which will then total 10,643 acres.

Of the land owned by Big Sky approximately seven acres bordering U.S. Highway 191 will be utilized as an information center. Two sites, the meadow village (el. 6,300 ft) will include some 810 developed acres and the Mountain Village (elevation 7,600) is to include 335 developed acres. A guest ranch, acquired by Big Sky located in the SW1/4 of Section 26, T6S, R3E. has been in operation since 1955. A total of 1,205 acres is to be held in its natural state until needed for future expansion. The balance of the acreage (8,293) is to remain untouched except for reforestation and seeding.

In the Final Forest Service Environmental Statement prepared by the Forest Service regarding land exchanges BN2 and BN3 the following statements

were excerpted regarding lands to be received by Burlington Northern in the trades.

"They have advised the Forest Service that these lands will be managed under multiple-use management practices for timber, mining; grazing and recreation pursuits."

"Environmental changes due to timber harvesting operations by Burlington Northern on the acquired lands will be minimal and will take place over a long period of time. Stream flow fluctuations will be minimal during harvesting operations under good land and timber management practices."

"The present wildlife and grazing uses of the land will change very little. Public use of the lands for recreation will likely increase as the lands are made more accessible by roads and as the population in the lower Gallatin Canyon increases."

In the Big Sky of Montana, Inc. Environmental Report which was included in the Forest Service Final Environmental Statement, Mr. Chet Huntley made the following statements: "So much for the plans and program of Big Sky, but what will Burlington Northern do with the remainder of the land which it will obtain from the U. S. Forest Service? It is of course, not for us to shape the land use policies of Burlington Northern but we of Big Sky entertain no qualms about the possibility of 'living next door' to the Burlington Northern; for a glance at any topographical map of the area tells us immediately that only a very minute portion of the land in question could invite development if the Railroad were to pursue that course. Rather, it is logically assumed by us at Big Sky that the Burlington Northern plans to include this land in its present selected logging and tree farming in the Gallatin Canyon area."

Also, included in the Big Sky of Montana, Inc. Environmental Report is the statement: "It should be noted for the record, that the Burlington Northern is a stockholder of Big Sky. For this reason, in addition to Burlington Northern being concerned with the highest and best use of its lands adjacent to the Big Sky project, as a land owner in its own right, it has an economic interest in the future and well being of Big Sky itself. Any development therefore of the lands to be acquired by Burlington Northern on the land exchange as well as Burlington Northern's own lands will be in conformance with the land use contemplated in the Big Sky project. Very much reinforcing this point is the following statement from the same report: "Big Sky in fact spent as much money (approximately \$600,000) purchasing outstanding timber rights than it did acquiring the land itself- to remove the very clear and present danger of the aforesaid logging operations planned for the Middle Fork."

As one of the adverse environmental effects which cannot be avoided that was cited in the Forest Service Final Environmental Statement the following is quoted: "The Big Sky project will take up space formerly used for community resource production of timber and livestock grazing. These uses will cease or at least be severely curtailed on Big Sky lands, including those acquired in the land exchange. Any loss here would have to be made up elsewhere or be foregone entirely. In the same report it is shown that in the West Fork and Beaver Creek drainages as a result of land trades 1, 2 and 3 that the United States will own 18,340 acres, (28%), Burlington Northern - 32,110 acres (50%), Big Sky - 10,650 acres (17%) and other owners - 3,400 (5%) compared to 32,640 acres by the United States (50%), 19,740 acres by Burlington Northern (31%) and other owners accounting for 12,120 or 19% before land trades 1, 2 and 3. It would appear from the above discussion that

lumbering faces an uncertain future in this area. In fact, Burlington Northern has already stated in the newspapers that it intends to shift the use of such lands from timber harvesting to recreation. It would also appear that to some extent this is true for grazing since a long-time Burlington Northern lessee did not have his grazing leases renewed this year in the West Fork Area.

As a result of being locked out of the West Fork area and other areas timber operators are now being forced to exercise timber options or look for new sources. A critical case in point is the application to the Forest Service by Burlington Northern for a permit to construct a road up the Porcupine Creek drainage. Such a permit is necessary since the road will have to cross Forest Service land in order to gain access to 9 sections of Burlington Northern land to harvest timber which was contracted to Yellowstone Pine. Compounding the problem is the fact that the Porcupine drainage is a major portion of the winter range of the migratory Park Elk herd. This area is already overgrazed by elk and the state has attempted by hunting and transplanting to keep the numbers of wintering elk below 1000 which is the estimated capacity of the total winter range in the Canyon. Furthermore the area is underlain by highly erodible Colorado shale at lower elevations and Tertiary volcanics at higher elevations containing large beds of volcanic ash.

To compound the problem more the Gallatin Canyon Sportsmans Association composed largely of canyon residents has bitterly opposed the Montana Fish and Game Department's Management policies. With the blessing of the Big Sky they are pressuring for an artificial feeding program to maintain the same population on the Winter range as can be supported on the summer range which

has a far greater carrying capacity (2000 at least). They also want the "senseless" slaughter of elk stopped.

This protectionist policy seems to be a part of the philosophy of management of Big Sky as we find quoted in the Big Sky of Montana Environmental statement: "One of the more important concerns of the impact of Big Sky is the influence on game animals in the West Fork area. At the present time no migration routes on winter range areas will be jeopardized by the development of Big Sky. The reclaiming of timber slash areas will improve browse and grass land areas, providing better habitat and subsequently increasing the carrying capacity. Hunting in the area will not be closed to the public but will be managed in a way to reduce overkills and poaching.

Another statement in the same document is as follows "No fences will be allowed in the project other than for aesthetic purposes and for guest ranch management giving wildlife freedom to roam." There is also a concerted effort by some local residents to establish a program to artificially feed Canyon elk. In Jackson Hole, Wyoming for instance, elk, deer, and moose graze in and close to existing residential areas, and are artificially fed at a cost to the U. S. Fish and Wildlife Service of \$200,000 annually for 8,000 elk and the Wyoming Fish and Game Department contributes an additional \$235,000 to buy hay for the remaining 12,000 elk.

Should the road be built up Porcupine Creek, the timber harvested and the elk herd increased by artificial feeding there is a good possibility that the Porcupine Creek drainage will suffer serious erosion and accompanying ecosystem damage. Because of their concern for this problem the Forest

Service is instituting an intensive ecosystem analysis of this drainage not only from the standpoint of it's present condition but much more important what is its potential? On the basis of these data, a management plan will be formulated to maximize a return of the area to its potential state. They have requested members of our NSF team to work with them in areas in which they feel they lack expertise such as geology, soils, vegetation, water quality and in cooperation with members of the Montana State Fish and Game Department. Since we feel this is a clear cut case of an impact of a large recreational development we have agreed to do this.

Big Sky's statement that "a program to restore and increase fish habitat will be initiated so that stocking does not merely become a "put and take" operation but a constant rehabilitation of population" is also interesting in view of present state policy of not depending upon stocking to maintain a stream fish population.

It is obvious that impacts are coming thick and fast and that we must monitor and assess the effect of Big Sky on fish, game, timber, and land management policies and obtain realistic information on the economic and social costs of these policies to the citizens of Montana. It is also imperative in this connection that we obtain the services of a political scientist to elucidate how political decisions are made in response to changing public demands in the face of standing public policies.

The rocks of the West Fork area are typical of this part of the Rockies in general. They range in age from earliest Precambrian (older than 550 million years_ through Recent. The ancient complex consists of granites, gneisses, and schists, but rocks ranging in age from 550 million years through

about 60 million years consist of the various marine shelf and continental types known as sandstones, shales, limestones, and conglomerates, each with its own peculiar characteristics. Culminating this sequence of the shales and sandstones of Cretaceous age which were spread out in deeply sinking deltaic troughs throughout the eastern Rockies just prior to the major orogeny (mountain building process) known as the Laramide Revolution.

During the Laramide Revolution, some 60 to 50 million years ago, - compressional folds of several orientations finally ended with the great break in the earth's crust known as the Spanish Peaks (or Gardiner) Fault. The Spanish Peaks block was uplifted along this trend in an elongate north-west direction and partially slid southward to overhang the adjacent non-resistant Cretaceous rocks now found in the axial part of the West Fork Basin. Volcanoes and shallow laccolithic intrusions arose along the fault zone producing Lone, Fan, and Cedar mountains, while smaller tabular or fanlike intrusions produced such features as Andesite Point and lesser dikes. Thus the stage was set and so it remains today, but modified by more recent erosional processes.

Although the West Fork area has been somewhat warped and tilted during the 50 million years following the close of the compressional phase of the Laramide Revolution, the framework is basically the same except for the embellishments caused by stream activity, landsliding and glaciation. The Spanish Peaks block has remained relatively high not so much because it was an uplifted block, but because the less resistant rocks have been stripped from it, exposing the very resistant basement complex. In contrast, the West Fork valley, being originally negative, has preserved soft Cretaceous

rocks on its surface, and these are now easy prey to stream action and are being lowered at a faster rate than the high peaks. Differential erosion is thus an important influence on topographic expression.

Although streams have been the most influential agent in shaping the secondary aspects of the topography, glaciers and landslides have done their share of modification. All three processes have been particularly active during the past two million years in response to dramatic climate changes characteristic of the Pleistocene geologic epoch. In addition, during this interval, and slightly before, incandescent clouds of glowing volcanic ash have contributed to the scene, the consolidated remnants of which appear as table-like deposits south of South Fork and on the divide between North and Middle Forks.

In that certain geologic formations are folded, faulted, or otherwise emplaced on the landscape, and these formations have various mineralogical or strength or chemical or absorbtive characteristics, the primary geologic relation affecting changing conditions brought about by man is one of constraint. How much disruption, for instance, may the Cretaceous black shale units absorb, before they begin to move as a mass? What are the interactions between an artificial lake and the rocks which line its banks and bottom? Will an earthquake created by a modern fault movement in the Madison Valley trigger rock falls which threaten a certain trail, campground, or building? Will liquid waste flush so rapidly through glacial outwash that it will behave virtually like an open sewer? The constraints in these kinds of situations dictate not so much the complete negation of man's modification, but, as with the treatment of soil types, certain extra engineering steps must be taken if modifications are made.

A second important role of geology involves the part both source rocks and surficial erosional or transportive agents play in supplying materials that go into the soils and surficial accumulations. These materials interact in turn with biological functions including those of man.

Lastly, geologic expression (which includes the geomorphic or surface form created by the erosional agents) is an important factor in aesthetic appreciation, which in turn is a basic facet of site-selection economics. It is a known fact that the South Fork cut a deep canyon where gravels of the lower outwash plain contact non-resistant black shale of the south valley wall. It is an aesthetic satisfaction to experience the canyon, but most of all to know something of the history behind its making. When viewed from the standpoint that it is a remnant of the ice age, and a system in equilibrium with certain very dramatic and diagnostic characteristics, the rock glacier extending from the east flank of Lone Mountain is a thing of beauty and very great interest, worth preserving undisturbed for posterity. It is no secret to climbers that gneiss and granite of the Spanish Peaks is more satisfying to ascend than the loose rubble of Lone Mountain volcanics or the purple silt-stone of the Morrison Formation.

Although the latter considerations are mostly intangible, there is yet an increasing tendency to quantify the scenic factors that contribute to pleasure. This movement may offset the often devastating cost-benefit ratio thinking that dominates judgement where development projects are being considered nowadays.

Although overlapping the renewal date, several individual projects in the coordinated geological investigation of the West Fork Basin area were completed. These served as the base-lines for evaluating the renewal project,

and they also set the stage for monitoring of construction and other man induced activities in this area where geology is concerned.

Two particular needs developing from the previous work in the West Fork Basin suggested that a synthesis of the surficial geology and a reduction of nomenclature to layman's terms would be a significant contribution. A second proposal involved the intensive study of high altitude erosional and transportation processes associated with the West Fork area, with particular reference to the ice content, morphology, mechanics, and rate of movement of the East Lone Mountain Rock Glacier. In addition, exploratory exercises in the interdisciplinary aspects of the previous work were to be introduced into the general study. Monitoring of construction projects was to be carried out as the situation developed.

Very little significant modification of terrain by man was brought about in 1971, but the Principal Investigator photographed and observed carefully the effects of road construction and stream diversion along the mouth of the West Fork, and in conjunction with the construction of buildings, golf course, and other activities in the Lower Village site. Monitoring of these areas remains on a standby basis for now and into the future.

Using geological data previously classified and mapped, a new practical map was created. This map is entitled "Surface Rock Materials of the West Fork Basin Area Appendix." The legend of this map is edited for the layman and includes not only the list of simplified features in this area, but a definition of those features in plain English, and a prediction as to what their best use might be from a construction point of view. The scale of the map coordinates with that of existing soil classification maps of the area and soils units correlate fairly well with geological units. Since the West Fork is but a

small part of the entire Gallatin Canyon Region, there is a need to continue these classifications for the rest of the Gallatin Canyon area at least.

The most important study developed through the present grant involves the East Lone Mountain Rock Glacier. This feature looms not only as a scientific curiosity worth preserving but as a sensitive political issue as well. As an outstanding example of a particular high altitude erosional and transportational process, the rock glacier, it can be argued, should not be spoiled by a man-made object; hence the present wilderness buffs wish it to be included within the Spanish Peaks Wilderness, and the naturalist groups wish it to be preserved as a "geologic area". As of this writing, the latter classification seems most likely and the proposed construction has wisely been shifted to a more stable area in the immediate vicinity.

The salient facts turned up in the current rock glacier study are essentially as follows:

- ice exists beneath the rock rubble on the surface of the rock glacier from head to toe, and at various depths below the surface.
- the rock glacier can be classified as consisting of three distinct parts; an upper active part, a medial semi-active part, and a stabilized part, each with its own distinctive characteristics.
- compressional ridges, concentric to the source area in the high Lone Mountain cirque, are repeated nineteen or more times in the upper active part of the rock glacier. These are separated by longitudinal ridges of lesser size and the latter are of as yet unknown origin.
- the scarp-like front of the periodic advancing lobes of the middle part assume the angle of repose of loose rock and display overturned lichen growths on the rocks, indicating somewhat recent movement.
- the fabric of rock rubble in the stabilized part of the rock glacier is impressive packed in contrast to the random fabric of the more active parts.
- movement of four inches in one summer month was believed to be detected by plane table and telescopic alidade survey. This is not a critical figure, since there is considerable chance for error with this method

of measurement. It will be possible to determine more critically the true movement by using a transit, as will be incorporated this coming summer.

- water from melting snow and ice runs beneath the surface rock rubble on top of the interstitial ice. In so doing, a certain amount of ice is melted and a deep furrow usually results. These run longitudinally with the glacier and water can be heard running down their axes.
- slumping of the mass along the thrust fronts creates backslopes and cracks which become furrows near the active fronts of advancing lobes.
- nested lobes of rock rubble probably indicate former lobate advance and collapse phenomena in the more stabilized part of the rock glacier.
- the particular grade of andesite porphyry rock making up much of the Lone Mountain complex breaks up in similar size particles about one foot in maximum diameter. They tend to be slabby, and provide ample rubble with which to insulate the ice of the rock glacier and help in its preservation. At the moment it cannot be determined whether old clear glacial ice lies beneath the upper part, but this is suspected.
- any water or discharge of waste upon the rock glacier is bound to pass rapidly through the rock glacier mass and into the ground water system which is probably the source of important potable water springs in the so-called Meadow Village site of the Big Sky Project.
- the rock glacier presents an aesthetic and interesting scientific display for the general public and should probably be used as the subject of excursions for the study and observation of natural phenomena.

Although the foundations for understanding and working with the geology of the West Fork Basin have been laid, it has been repeatedly demonstrated of late that the lack of geologic understanding of the main Gallatin Canyon and certain critical tributaries, as well as that of the Jack Creek drainage, is holding up progress in true comprehensive scientific appraisals. Geology should be correlated with the existing soils classifications of these areas, and with such other disciplines as may be pertinent.

The new phase of study will be aimed toward analysis of natural stability of the areas in question, of the sediment-producing potential of these areas, and the monitoring of existing study areas under a variety of pending impact

conditions. The lands held by Burlington-Northern RR in the upper Porcupine drainage of the Gallatin River system are scheduled for increased use partly as overflow and displacement from the Big Sky complex, and partly because extensive logging is scheduled here. The predictable result will be access roads through public lands in an area of very non-resistant shale and soft friable sandstone. The area also happens to be an elk wintering and feeding grounds and an outstandingly high quality beauty spot. The soils-geology relationships here need to be known immediately not only to help guide the proper use of the area but to understand what effects overuse may have. The results of this study may well become key guidelines for the future of similar areas throughout the United States.

Many different types of slide, active and stabilized, are presently in existence in this general area. Some of these have been mapped already, but none have been studied intensely, nor have they been examined from the standpoint of the rate and nature of movement taking place at present. Further, the characteristics of the Gallatin River are unknown and should be known - its flood cycle, its meander pattern, the rate of movement of sediment into it from the sidewalls of its canyon, the sediment load of the Gallatin and its tributaries. Two of these tributaries, Porcupine and Taylor Fork creeks already have the most impressive visual sediment load of any drainage in the entire Gallatin Region, but no true knowledge of the source of this contamination has been determined. These studies need to be undertaken now.

The East Lone Mountain Rock Glacier is now fairly well understood. It remains as a classical example of this type of phenomena in this region, if not the entire Rocky Mountain region. Its movement is not well known, and a brief number of monitoring measurements should be undertaken this summer to

determine accurately with transit what that movement happens to be. Other slide movements along the Gallatin Canyon and Porcupine and Taylor Fork drainage will be measured in this way also.

As for future work during 1972-73, close coordination is now underway between the geology and soils teams. With this in mind, the following schedule is proposed and details of the soils objectives are listed with the soils report.

From April through June 1973 reconnaissance mapping of the critical Porcupine drainage by a graduate research assistant in geology and one in soils. This group will also have the help of a range specialist in delineating the areas where future animal and human impact are bound to be felt and are bound to clash. This rapid reconnaissance will set the stage for intensive work on critical features later in the summer. These will include studies of landslides, and sources of siltation. The mutual reconnaissance will assure that the team is working together throughout the field season and approaching the problems in an interdisciplinary way.

During July 1972 the senior investigator and the geology graduate assistant will commence and finish mapping and detailed investigation of surficial geology features in the Gallatin Canyon from the mouth of Porcupine Creek to the mouth of the Gallatin Canyon. This study will pinpoint moraines, talus, landslides, terraces and other important surficial features. It will also allow the completion of a surficial and use-oriented geologic map showing surface geomorphic features from the standpoint of their utility. Ordinary and extraordinary mass-movement phenomena will be spot checked by transit to obtain quantitative opinions as to the rates of downhill movements. In addition the Senior Investigator will monitor West Fork Basin geologic units

influenced by construction activities, will make transit survey of the East Lone Mountain Rock Glacier, and will lay groundwork for interpretive geology and displays for the general public in these areas.

During this month, a PhD candidate working under the principal soils investigator will commence the intensive investigation of soils-geology phenomena in various selected sites of the Upper Gallatin Region as described elsewhere in this proposal. He will be coordinating with the geologist. All will be mutually available for help when needed in such things as surveying, difficult traverses, statistical counts, and the like.

From August through September, 1972 the Senior Investigator will revert to non-compensated time while the geology student will work out the geologic details of the Porcupine drainage which were formerly established by reconnaissance. This will include general bedrock stratigraphic and structural relations, the detailed cataloguing of surficial materials, and the surveying of mass movement features in cooperation with the soils major. If this work proceeds rapidly enough, a second priority of activity will include similar work in the Taylor Fork drainage.

Extensive use of geology and soils information gathered on this project was made use of by the State of Montana Department of Highways in their Draft Environmental Statement for Project F-20 (1) U. S. 191 Spur to the Big Sky Upper Village.

After discussion with Big Sky Management they have agreed to alter their plans to construct their ski lift up Lone Mountain in such a manner as to not interfere with the Rock Glacier. They also recognize the value of preserving the rock glacier as a unique natural phenomenon for the benefit of their guests and other visitors.

A major report "Soil Interpretations for Land Use Planning and Development in the Gallatin Canyon Area, Montana", Montana State University, was published by Montana State University, October 1971 (Appendix)

Members of the study team and cooperators in federal agencies have found numerous opportunities to demonstrate applications of the information developed under this subproject. We have sought and obtained suggestions from user groups and decision makers to help bridge communication gaps between soil scientists and the public. Materials generated under this project, including maps of soils, land use and soil limitations, have to date been demonstrated in some 40 formal presentations. Twelve were meetings of federal agencies and regional professional organizations. Fifteen involved various state agencies and universities and 14 were before city and county organizations and small groups of individuals interested in land use planning. About 1000 copies of the publication were distributed by mail for reactions from residents, land owners and land management agencies of the canyon. The U. S. Forest Service has used the soil resource data and interpretations to prepare an environmental impact statement in connection with a land trade important to the "Big Sky" development. Soils and land use information obtained under the NSF project constituted a large portion of the reports submitted by Murray and McCormick, the firm hired to develop a land use plan for the Gallatin Canyon. Soil maps were used to locate sites for studies of septic tank pollution potential. The maps were also used to locate sampling sites for determination of soil engineering properties.

The following is a list of maps that have been prepared:

1. "Vegetation of Spanish Peaks/Lone Mountain Area" (Black and white)
2. "Vegetation of Spanish Peaks/Lone Mountain Area" (Color)
3. "Surface Rock Materials of West Fork Basin Area" (Black and white)

4. Locations of Investigation Sites
5. Areas of High Potential for Development
6. Locations of Recent Land Sales
7. Native and Migratory Elk Range Locations
8. Areas of High and Low Air Pollution Potential
9. Soil Limitations for Foundations - Low Buildings with Basement
10. Soil Limitations for Septic Tank Filter Fields
11. Soil Limitations for Sanitary Land Fill
12. Soil Limitations for Playgrounds
13. Soil Limitations for Roads and Parking
14. Soil Limitations for Camping Areas
15. Soil Limitations for Picnic Areas
16. Soil Limitations for Trails and Paths
17. Land Ownership - Gallatin Canyon
18. Present Land Use - including recreation and campground locations
19. Geologic Limitations for Construction of Roads, Buildings, Ski Lifts and Areas, Dams, Sewers, and Other Utilities
20. Slope Map
21. Precipitation Map

Analysis of the maps revealed some areas in the canyon where environmental impact of development is likely to be severe. Some of these areas will probably be developed. At other locations, only slight environmental disturbance would be expected from careful development.

A general land use survey map was prepared covering 117,000 acres in the canyon area at a scale of 1:63,360. Land use was classified as follows:

- F₁ - standing forest
- F₂ - logged forest (ie: - slash, dozer piled)
- F₃ - immature forest (young growth)
- R - range
- R_m - range (alpine meadow type)
- P - pasture (managed)
- Ac - residential area (concentrated)
- An - residential area (not concentrated)
- W - park - woodland areas

Rock slides, talus and cliff areas are designated by appropriate spot symbols.

As part of the present land use survey approximately 120 sites were located and plotted on an overlay of the base map. These sites are accessible

by vehicle and as a general rule are used enough during the year to show some physical evidence of use. Each site was described as to type of activity, size, general condition, facilities and whether it was officially planned or became established by impromptu actions.

Excavation of septic tank filter fields and analysis of soil samples suggests that no phosphorous and little nitrogen moves more than 20 feet from the source in the loamy soils examined. Suspended organisms are likely to move much shorter distances. Efforts are being made to extrapolate information to soils in Gallatin Canyon where installed systems were unavailable for study.

The soil survey with general interpretations for planning and development is complete and published. Next years research should be concentrated in the following three study areas:

- 1) Testing usefulness of the results. Methods of integrating and displaying data on soils and related resources will be evaluated to find practical methods that will be interesting, understandable and convincing to the public and that will be used by individuals and agencies that manage, regulate or plan the use of land. Numerous presentations of the data interpreted for land use planning have suggested that continued effort should be made to display results in terms of dollar costs of overcoming natural soil limitations for the construction and maintenance of roads, trails, foundations, septic tank filter fields and other uses. The Ph.D. thesis of Bruce Leeson will be a major contribution in this study area.

Other project investigators will be assisted in their efforts to apply data on soil capabilities, soil landscapes and land use to their subprojects. This subproject will contribute to a regional project on soils and land use which will involve nine western universities, the SCS, Forest Service, Bureau

of Land Management, Bureau of Reclamation and several state and local agencies.

2) Soils as natural filters of nitrogen and phosphorus in sewage effluent.

Results have shown no increase in N and P concentrations beyond 20 feet from septic tank drain tiles. Microorganisms probably move much shorter distances. This suggests that present health regulations stipulating 100 ft. set back from streams may be adequate. However, disposition of nutrients in areas of very stoney soils is not understood. Officials of the State Department of Health and Environmental Sciences have expressed their particular interest in this disposal problem. We propose concentrated study on these difficult sites this year. The goal is to develop a more objective method of rating the pollution potential from sewage disposal on river terraces and fans which are so readily subjected to development.

3) Landscape stability, water quality and land use. This is part of the interdisciplinary study described by the geologists. Two of the most significant environmental impacts associated with improper land use in mountainous regions are 1) activation of unstable areas expressed as mass movements (landslides) and as erosion of the soil surface and 2) change in water quality through the addition of sediment from unstable areas.

A Ph.D. student will attempt to derive a landscape stability prediction system applicable to other mountainous areas. The work will be in cooperation with the Forest Service and will be related to the agency's soil-hydrologic unit mapping system. We anticipate that this information will be used by the Forest Service in upcoming evaluations of roadless areas for wilderness designation. Results will also be related to the national soil survey system used by the SCS, other federal agencies and land grant experiment stations.

Samples of surface water in the Gallatin Canyon have been collected by many individuals. Little has been done to locate the specific sources of suspended sediment in these samples and to estimate the changes in sediment load from potential changes in land use. We would attempt to relate land use, ground cover, soils, geology, slope, meteorology and many individual investigators have agreed to cooperate in this effort. Effects of roads, trails, elk and logging on landscape stability and water quality will be studied. This interdisciplinary subproject places high priority on observations in the West Fork, Porcupine, Taylor Fork, Jack Creek, Cedar Creek and other drainages where water quality, land use, geology and soils are of special interest. Additional details and a preliminary work plan are reported in the section written by a geologist.

A paper entitled, "Hydrology of the West Fork Drainage of the Gallatin River, Southwestern Montana, Prior to Commercial Recreational Development" by Wayne A. VanVoast, Montana Bureau of Mines and Geology, was published by the Montana College of Mineral Science and Technology, Butte, Montana, September 1971. The following conclusions were reached.

Average annual precipitation for the West Fork drainage is about 156,000 acre-feet per year. Of this, about 61,000 acre-feet leaves the area as runoff, and about 95,000 acre-feet is lost through evapotranspiration. On an annual basis, about 24,000 acre-feet of streamflow originates in subdrainages where commercial recreational development is planned, and about 37,000 acre-feet of streamflow originates in subdrainages where development is not planned. During the lowest flow period of the 1971 year, discharge from the West Fork drainage was 12.3 cfs, of which 6 cfs originated in subdrainages of planned development and 6.3 cfs originated in subdrainages not to be developed. Based on the

history of minimum flows for the Gallatin River near Gallatin Gateway, the lowest flows measured in the West Fork drainage were likely higher than in most years.

Ground water is available for wells in bedrock and unconsolidated aquifers. Although almost no well data are available regarding bedrock aquifers in the West Fork vicinity, lithologies and performance in other areas indicate that the Madison Group, the Sawtooth Formation, the Swift Formation, the basal part of the Kootenai Formation, and possibly the Quadrant Formation are likely sources of ground water. Unconsolidated materials that cover much of the land surface are the most accessible and widely used sources of ground water in the area. Saturated thicknesses as great as 58 feet were found, and yields as large as 200 gpm were obtained by consultants exploring for ground water.

The surficial aquifer and the streams are interdependent in the hydrologic system. In some places the aquifer discharges to the stream but in other places the stream discharges to the aquifer. The directions of flow are at least partly a function of precipitation, and probably change seasonally. Because of their interconnection, neither streams nor the surficial aquifer should be looked upon as independent sources of water; withdrawals from one source can affect water availability in the other.

Most of the water in the unconsolidated aquifer is a calcium magnesium bicarbonate type suitable for domestic, stock, and irrigation use. Hardness of most samples of the water is less than 250 milligrams per liter and dissolved solids content is less than 350 milligrams per liter. Anomalous relatively strong concentrations of sodium and sulfate in a few samples suggest possible influence of water from bedrock aquifers. If so, water in the bedrock aquifers may be of less desirable quality.

In addition to the three Stilling wells and recorders that were installed in 1970 on the North Fork, South Fork and West Fork two additional 4-ft Parshall flumes and recorders were installed at the Middle Fork at the Upper Village and on Crail Creek.

Continuous hourly records of precipitation are being taken in cooperation with the project climatologists, by weighing typ recording raingages at 5 sites along an altitudinal gradient as follows: Big Sky Information Site 6000 ft, climatological site overlooking Meadow Village 6600 ft, Mountain Village 7700 ft, Andesite Mountain 8400 ft, Lone Mountain 9500 ft.

Periodic measurements have been made of water levels in 8 observation wells in the West Fork drainage, mostly concentrated at the Meadow Village, but with one on the North Fork and one at the Mountain Village. These wells will be equipped with recorders in 1972 and continuous records will be kept.

The study is aimed at providing a water balance study of the West Fork drainage which contributes 15 - 20% of the total flow to the West Gallatin River.

The use of water in Montana was deemed so vital to the prosperity of the people and so much a contributing factor to the welfare of the state that the people, in adopting the constitution, declared it to be a public use. Every citizen has a right to divert and use water for a beneficial use so long as he does not infringe upon the rights of others acquired by prior appropriation. Beneficial uses of water in Montana are for agriculture, mining, logging. Under present Montana Law, fish do not have a right for beneficial use of water and neither does recreation. Thus, the Doctrine of prior appropriation on "the first in time is the first in right" was established as being the most desirable means of controlling water use in Montana. The water rights

acquired pertained to surface waters until the 1961 Legislature passed a Ground Water Code effective January 1, 1962.

Surface waters have been appropriated in two ways. The first is by the rules and customs of the early settlers of the state wherein a diversion ditch was completed for some beneficial purpose. The doctrine of "relation back" establishes the time, use and quantity of the right though the burden of proof is on the appropriator. The second is by the rule of posting as set out in the written law. Here, the procedure is to follow the written law by posting a notice of intention at the point of diversion, filing a copy in the office of the County Clerk and Recorder within 20 days and proceeding to put the water to beneficial use.

In the case of ground water, a "notice of appropriation of ground water" is filed with the County Clerk and Recorder and upon completion of the well a "notice of completion of ground water appropriation" is filed. Copies of these forms are forwarded to the Montana Water Resources Board, which acts as the administrator of ground water rights, and the Montana Bureau of Mines and Geology.

It should be recognized that appropriated water rights furnish no guarantees to the appropriator. In order for an appropriator to be fully assured of his water rights, the appropriative rights must be adjudicated. In the case of surface water rights this process is handled by the courts. For ground water rights the Montana Water Resources Board has been declared the administrator and is empowered to adjudicate all rights in ground water basins. Once the water rights have been adjudicated, the appropriator is said to have a "decreed" water right.

The research on water rights of the Big Sky area and West Gallatin River divided into two phases. Phase I, was a study of the actual or physical diversions of water from the West Gallatin River system above Spanish Creek. This includes an on-sight examination of all canals, ditches, headgates or pumps used to establish or maintain a water right. Measurements were made of the slopes, roughness and cross sectional areas of each ditch to determine the actual maximum flows diverted through each structure and to compare these flows with the recorded rights.

Summary of 1971 Data

There are 20 diversions not filed on or shown in recent decreed rights.

There are 4 diversions where the flows are less than the decreed rights

There are 6 diversions where the flows are greater than the decreed rights

There are 3 new ditches or ditches established in the past five years with no filings.

There are 12 ditches which have been unused for several years. The rights are still attached to these diversions.

Since January 1, 1972, twenty-four talks or speeches have been given throughout the state, to farmers, ranchers, professional societies, federal and state agencies. Two of the talks were to the Constitutional Convention delegates and one was to the League of Women Voters.

To date, Phase I is ninety-nine percent complete. There are two small diversions which were located after the snowfall. These will be traced out and measured as soon as the weather and snow permits.

During the winter months, a search has been made of the court and congressional records to determine the reservations, priorities and authority over the waters in the West Gallatin drainage. These are key factors to the planning

and development of water use. A search of the records indicates most of the water in the West Gallatin drainage originates on Forest Service or other federally controlled lands and railroad land. A recent U. S. Supreme Court decision has recognized the Reservation Doctrine for such land, as of the date of reservation. Therefore, the Forest Service has a prior right over those rights which have been made since February 1897. They must show a need when making such a claim.

The reservation Doctrine can influence the development of all recreation areas. If the development is in agreement with Forest Service policies and requirements, no problems will be encountered. However, if the development is on private land and the water originates on Forest Service land or other federally controlled lands, the rules and regulations of the federal agencies can and will dictate the terms of development. A tabulation of the dated rights will be made to determine those rights which are prior to February 1897. This recent court decision gives the federal government extremely great power in affecting water use for any type of development where such water originates on federal land.

Phase II, of this project was to prove the validity of each of the water rights as claimed or as recorded at the Gallatin County Courthouse. Wherever possible, the property deeds must be checked to determine if the rights have been separated from the land or if they are attached. If the rights have been sold from the land, it will be necessary to determine if new rights have been established by prescription. This phase of research is very difficult and time consuming. It requires the cooperation of all land owners to be successful.

The seniority of all water rights will be checked and analyzed to

establish which rights have seniority to the Reserve Doctrine date of February 1897. These rights can be used in planning and development, unaffected by federal agencies.

The purpose of the phase is to prove the adequacy of the present system of recording, transferring and administration of water use. This phase will be primary during the research year beginning July 1, 1972 thru June 30, 1973.

This presentation is directed to a preliminary estimate of the comparative air quality and potentials for pollution at Bozeman, Missoula and Big Sky as it relates to the local topographic situation at these places. Certain aspects of the hypotheses presented here will almost certainly have to be modified as more information becomes available. This presentation may be considered as slightly beyond the stage of a rough conceptual model. As more data becomes available, good quantitative relations should be established which may or may not agree with the estimates presented here.

On the basis of bioassay with fungus spores and large air ion concentrations for coinciding periods, quantitative values have been assigned for measuring air quality. Figure 9 illustrates the relation of fungus spore germination to large air ion concentration. The data are based on three critical periods of air ion monitoring at Bozeman and one critical period at Missoula. If the large air ion concentration averaged less than 150/cc air over a 24-hour period there was no detrimental biological effect. Ranges of 150-200, 201-250 and 250 large air ions per cc of air resulted in average decreases in spore germination of 29, 53 and 86% respectively. Four general classes of air quality are considered: high, intermediate, low and very low depending on the concentration of large air ions.

Figure 9. Relation of spore germination percentage to large air ion concentration.

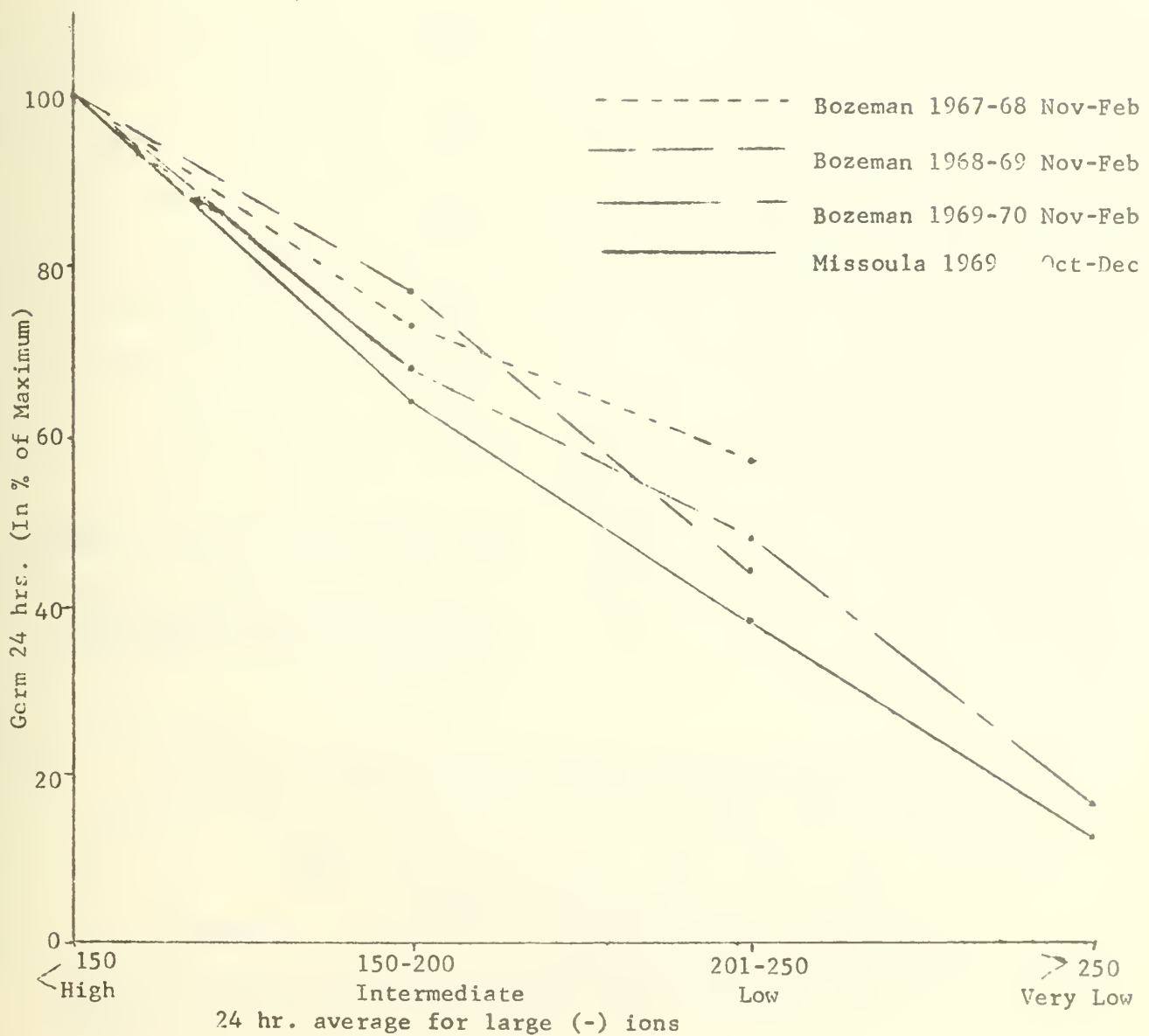


Table 7

Comparison of air quality for different locations and years.

Air Quality

Location and Year	Rating**	Classes* (% of total days monitored)			
		High	X ₁ Intermediate	X ₂ Low	X ₃ Very Low
Missoula 1969 (Oct-Dec)	74	40	34	20	6
Bozeman 1969 (Oct-Dec)	93	78	20	2	0
Bozeman 1967-68 (Nov-Feb)	92	76	21	3	0
Bozeman 1968-69 (Nov-Feb)	88	68	23	9	0
Bozeman 1969-70 (Nov-Feb)	87	70	20	7	3
Bozeman 1970-71 (Nov-Feb)	89	62	38	0	0
Bozeman 1971-72 (Nov-Feb)	87	66	21	13	0
Big Sky 1970	100	100	(no period lower than high rating)		
Big Sky 1971	100	100	(6 short periods with intermed: rating, one short period with low rating)		

* Large ions per cc of air: High = <150, Intermed = 150-200, Low = 201-250, V. 10w = > 250.

** Rating = $100 - (x_1) (.29) - (x_2) (.53) - (x_3) (.86)$

x₁ = number of days Intermediate class

x₂ = number of days Low class

x₃ = number of days Very Low class

It has also been determined that the correlation between large ion concentrations and uncharged particles of the same size is on the order of +0.90, further substantiating the fact that large air ion concentrations strongly reflect the status of air pollution. On an average, 300 large ions per cubic centimeter are associated with about 50,000 uncharged particles of the same size per cubic centimeter.

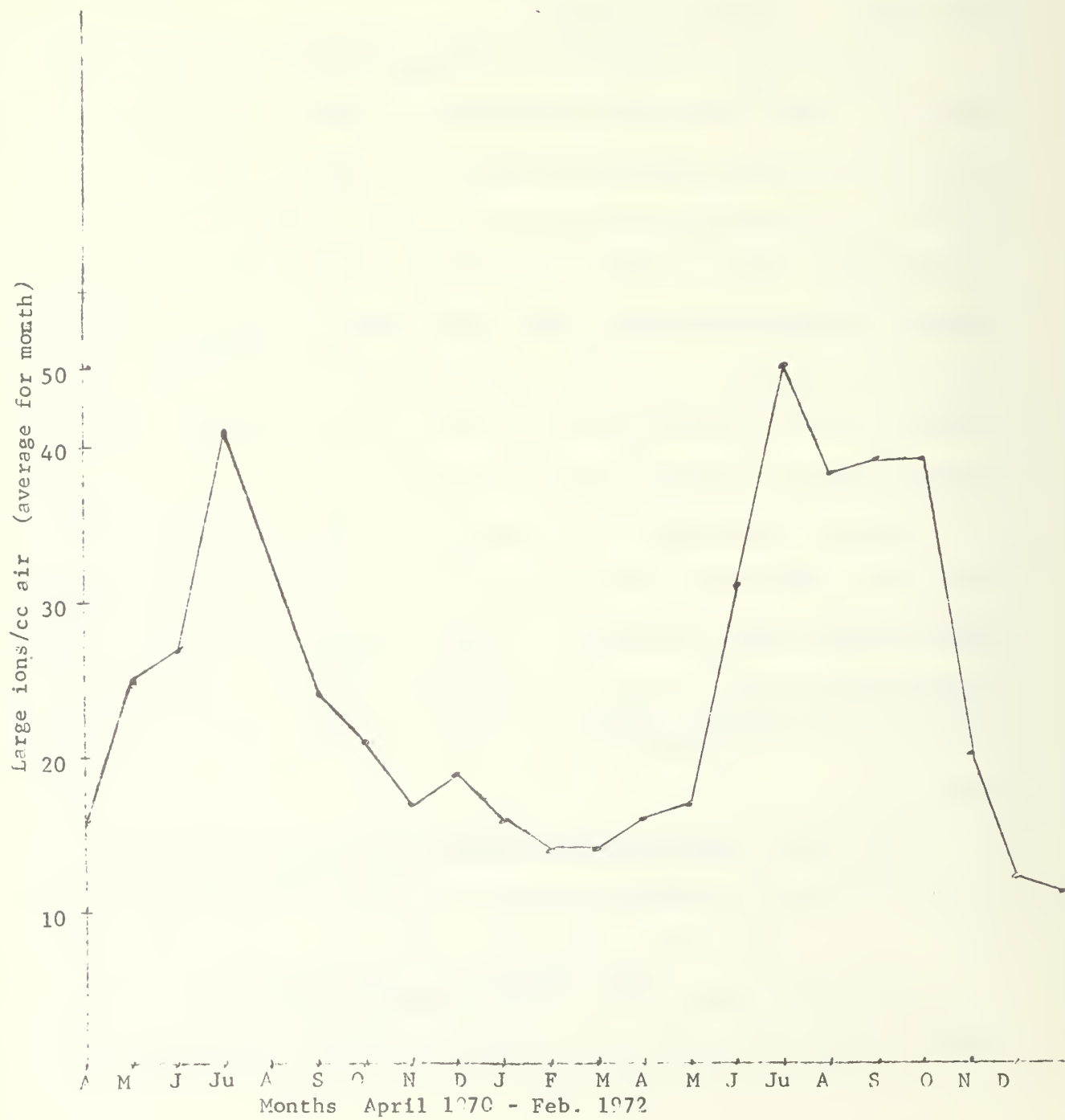
Table 7 shows how information from Figure 9 was used in determining air quality ratings for various locations and periods. It will be noted that Missoula had the poorest air quality, that Bozeman is showing some reduction in air quality with time and that Big Sky presently has a high air quality rating. Figure 10 gives average values for Big Sky for the months from April 1970 through February 1972. Even though the number of large air ions was low throughout the period, increases can be noted for periods of maximum activity in the area during the summer and fall months. Comparable monthly averages for Bozeman are given in Figure 11.

Figure 12 summarizes the air quality for Bozeman for a period of five years. There appears to be a gradual trend towards reduced air quality. Over the 5-year period the numbers of days of high air quality have decreased and the number of days of low air quality have increased. If this trend continues at the same rate, in 10 years the air quality would decline about another 20%.

Each of the three locations, Missoula, Bozeman and Big Sky, are situated in different topographic settings. These are illustrated in Figure 13.

Missoula is located along the Clark Fork River in a deep valley. Cold air drains from the hillsides at night creating a pool of cold air in

Figure 10. Large air ion concentration by season, Big Sky.



Bozeman 1968,69,70

160,
Figure 11. Large air ion concentration by season, Bozeman.

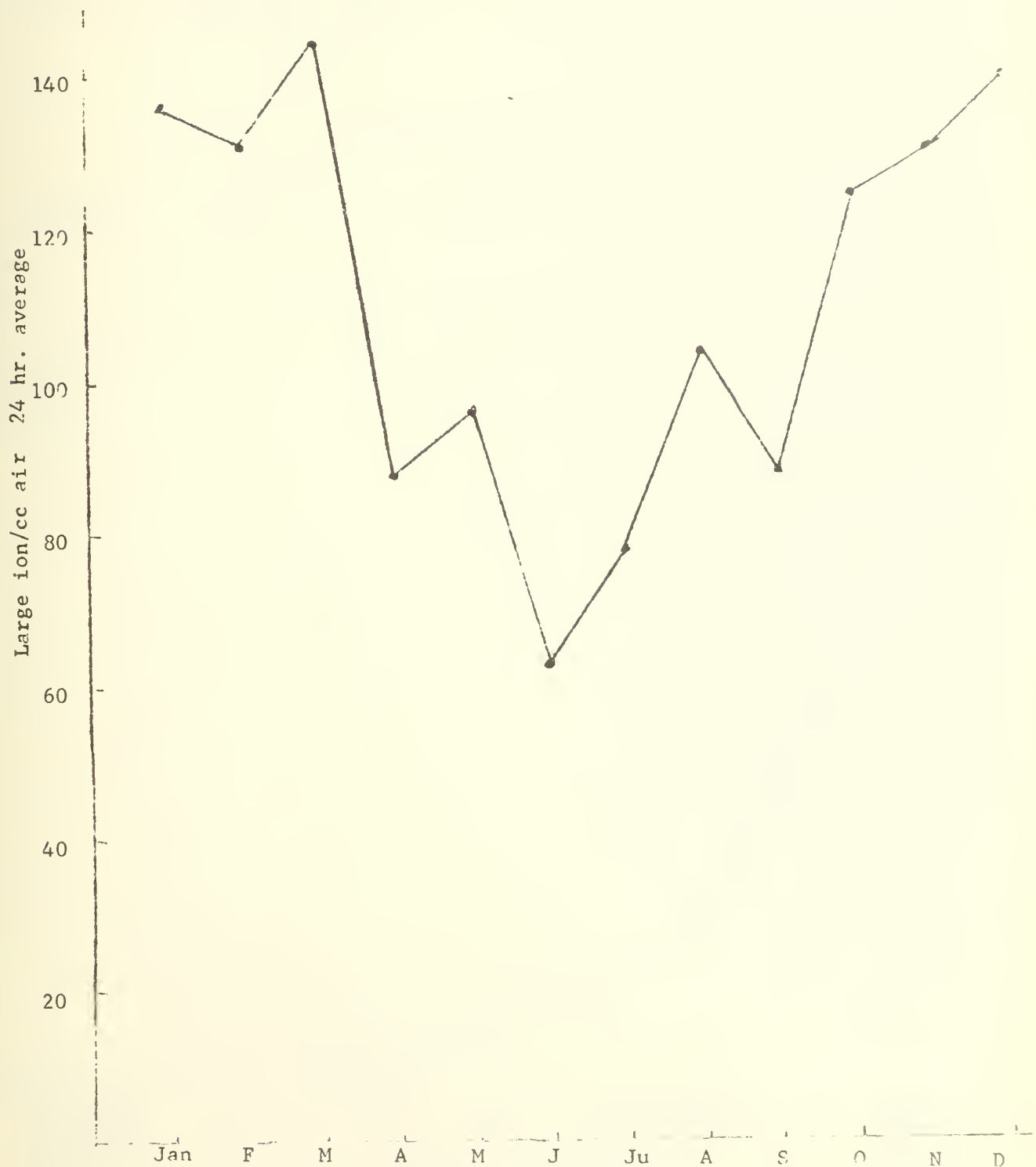


Figure 12. Air quality categorized from 1967-1972, Bozeman.

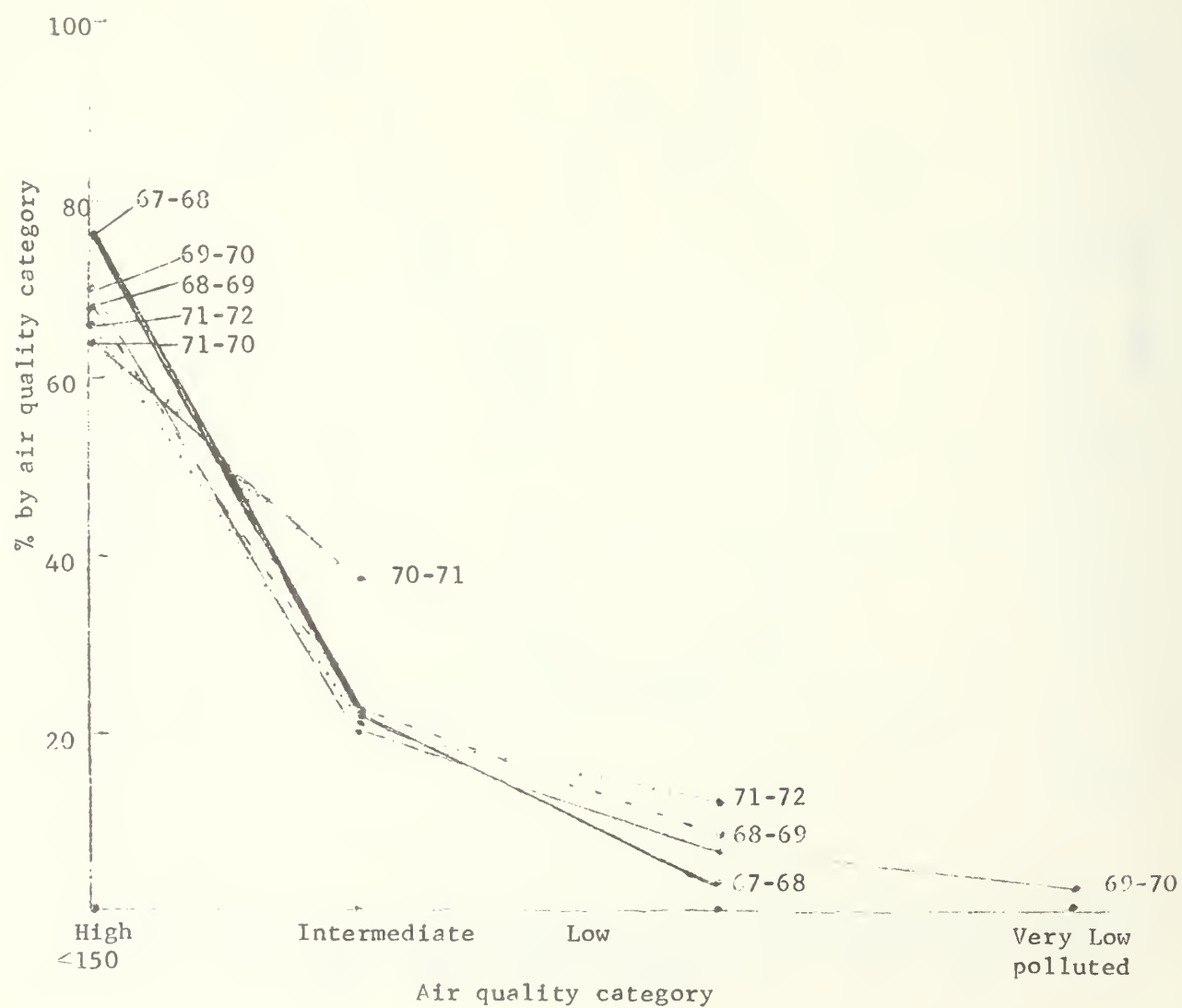
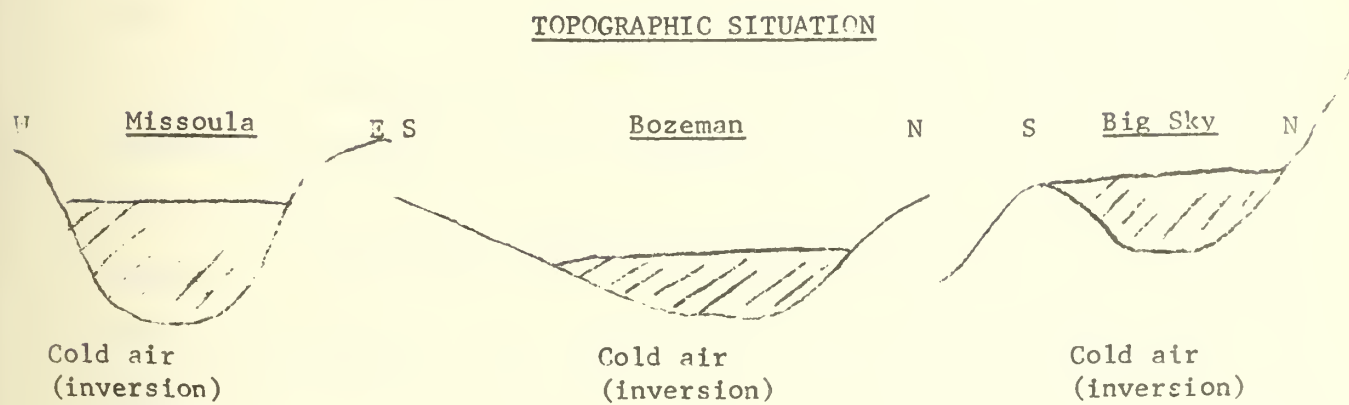


Figure 13. Topographic situation at three locations and associated nocturnal inversions.



the valley with the temperature inversion often extending upwards to a height of about 1,000 feet. During the winter these inversions sometimes persist throughout the day and pollutants released into the atmosphere tend to remain trapped in the valley.

Bozeman is located on the southeast slope of the Gallatin Valley. This is a very large open valley some 30 miles across. Typically, a cold air lake forms in the lower elevations of the valley especially at night when the weather is clear and calm. Unlike the narrow valley situations at Missoula and Big Sky, Bozeman tends to be situated above the cold air lake and is well drained at night by katabatic winds draining from the southeast.

Big Sky is located along the West Fork of the Gallatin River. The mountains to the north rise sharply about 2,000 feet above the valley floor. The mountains to the south, however, extend only to a height of about 600 feet above the valley floor. As in the case of Missoula, cold air drains into the valley from the surrounding hillsides, but when the cold air builds up to a height of about 600 feet, it spills over the lower hills on the south side of the valley. While inversions often do extend to greater depths, they tend to be most developed in the lower 600 feet. Thus, the pollution potential, governed by the height of the inversion, is intermediate between Missoula and Bozeman.

Taking these topographic and related inversion situations into account, it is assumed that air quality at Big Sky will be about mid-way between Bozeman and Missoula.

Before comparing potential air quality at these three sites, let us again classify air quality according to the ratings illustrated below:

Air Quality Classification

High	<	150 large ions cm^{-3}
Intermediate		150-200 large ions cm^{-3}
Low		200-250 large ions cm^{-3}
Very Low	>	250 large ions cm^{-3}

Considering a projected population at Big Sky in 1985 of roughly 10,000, we can compute air pollution potential as follows:

Air Quality Ratings for Given Populations

<u>Population Assumed</u>	<u>Missoula</u>	<u>Bozeman</u>	<u>Big Sky</u>
20,000	74	87	81
10,000	- 0 -	93	95

Air quality at Big Sky in 1985 is projected here to be somewhat higher than the present level in Bozeman (95 compared to 93). Air quality at Missoula has reached the point where it has been necessary to appropriate funds for control measures.

Since the nocturnal inversion at Big Sky tends to be well developed compared to Bozeman, the air quality at Big Sky has a diurnal pattern with lowest quality at night (84 percent) and highest quality during the day (100 percent). The air quality at Bozeman, however, is characterized by a relative lack of a diurnal cycle. Figure 14 shows these relations.

Considerable input is being received presently from other principal investigators which is helpful in the air quality study, particularly from a predictive standpoint. These include the scientists investigating soils, traffic, water quality, economics and sociology.

Figure 14. Comparisons of air quality in 1970 and 1985 at Big Sky and Bozeman.

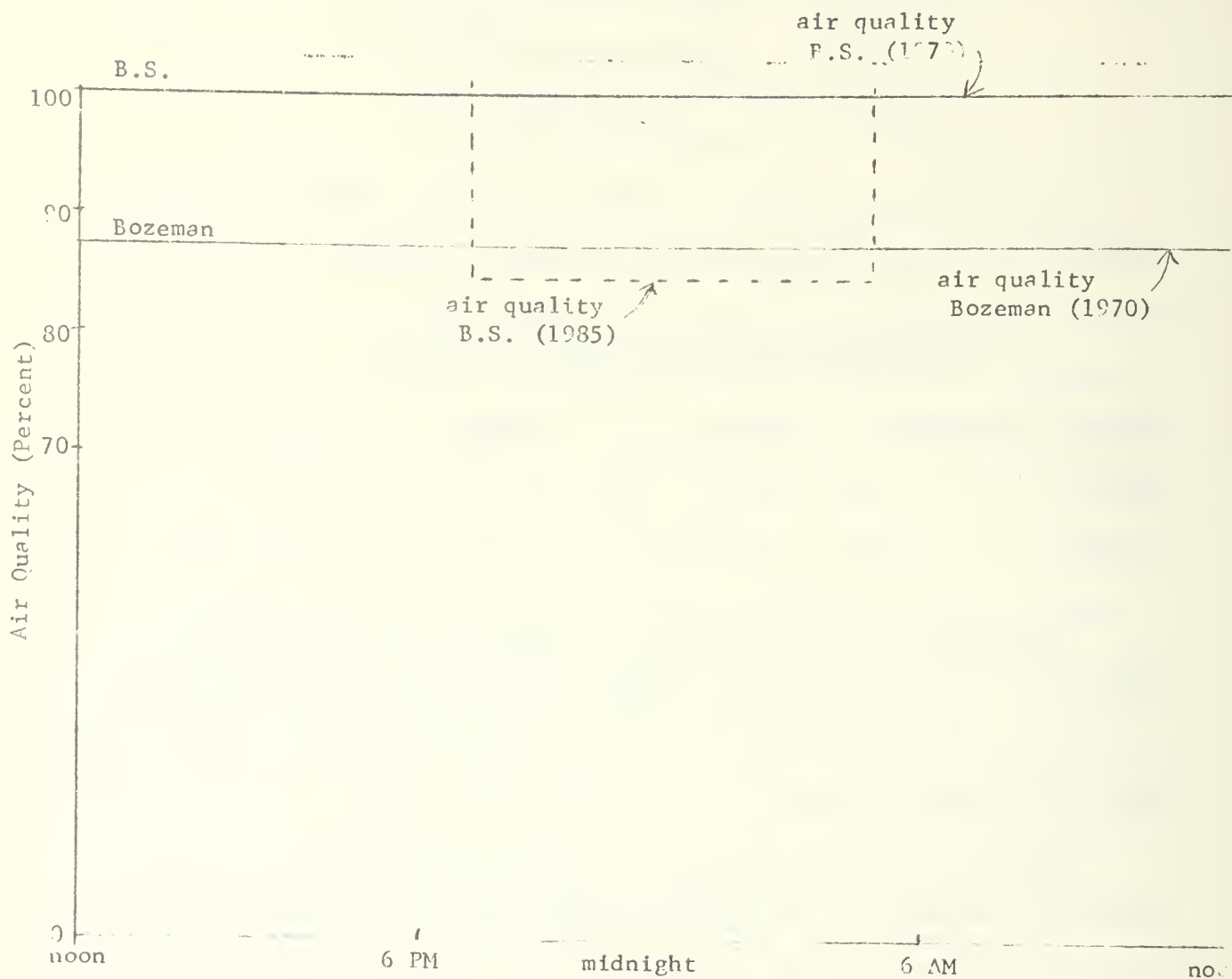


Figure 14. Comparisons of air quality in 1970 and 1985 at Big Sky and Bozeman.

The eutrophication study originally proposed had to be dropped as the project leader was hired as a staff ecologist on the Montana Environmental Quality Council and no one was qualified to assume his position. However it was possible to assess the potential pollutional loading the West Fork of the Gallatin and the West Gallatin River could take before serious problems would arise.

The East Gallatin River is similar chemically to the West Gallatin River but has been extensively polluted by domestic sewage from an inadequate primary treatment plant serving the City of Bozeman. Extensive and intensive studies have been undertaken of this river above and below the sewage outfall for several years. These studies have encompassed water chemistry, microbiology, species composition, diversity and the autotrophic index of benthic algae, primary production, algal assay studies, benthic invertebrates and toxicity studies to trout. An enormous amount of information has been gathered on the effect of domestic pollution in this river from which certain deductions were made concerning the nutrient loading that would be permissible in the West Gallatin River as a result of domestic sewage pollution from recreational development of the canyon.

We had to ask ourselves a question however, as how eutrophic a stream had to become before it became a nuisance. We decided that the first person to notice a deteriorating condition would be the fishermen. Based on our experience they begin to complain when growths of "moss" (Cladophora) become great enough to interfere with their fishing tackle. Therefore we decided that nutrient concentrations sufficient to cause such growths should not be exceeded. Based on our experience in the East Gallatin River dense growths of Cladophora still occurred in the recovery zone when ortho-phos-

phate concentrations had dropped to an average of 0.10 mg/l $\text{PO}_4\text{-P}$. This level of phosphorus concentration was accompanied in the East Gallatin River by an average concentration of 0.74 mgN per liter of nitrate, nitrite, and ammonia nitrogen. It was also at this concentration of phosphate phosphorus that the highest density of aquatic invertebrates were present. Hence even though the river had the highest standing crops of fish food the difficulty of fishing in it made it unsuitable

The concentration of 0.10 mg/l P is identical to the upper limit recommended by the FWPCA "Report of the Committee on Water Quality Criteria".

During low flow conditions, samples of water for chemical analysis were collected on 7 different dates from August to November 1970 from the West Gallatin River at 11 stations ranging from the Yellowstone Park Boundary to the mouth of the Canyon. The samples were collected from stations above and below tracts of private land suitable for development. Samples were also collected following the same schedule at the mouths of 11 major tributaries. The average concentration of total phosphate amounted to 0.038 mg P/l and ranged from an average high at the Yellowstone Park Boundary of 0.045 mg P/l to a minimum of 0.023 below the mouth of the West Fork.

Nitrate concentrations averaged 0.004 mg $\text{NO}_3\text{-N/L}$ and ranged from an average high of 0.011 mg/l at the Yellowstone Park boundary to 0.000 mg/l $\text{NO}_3\text{-N}$ below the mouth of the West Fork.

As for the West Fork itself total phosphate averaged 0.028 mg/l P and nitrate 0.003 mg/l $\text{N}_3\text{-H}$.

Interestingly enough two tributary streams with negligible or no development on them, Swan Creek and Squaw Creek, averaged 0.102 and 0.100 mg/l P respectively which would place them in the danger class as far as

eutrophication potential from phosphorus alone. However, nitrate concentrations averaged 0.002 and 0.012 mg/1 NO_2 -N. Also two other tributary streams, Hell Roaring and Spanish Creek had the highest nitrate concentrations averaging 0.044 and 0.037 mg/1 NO_3 -N respectively but with phosphate concentrations averaging 0.029 and 0.031 mg/1 total phosphate.

Ground water from wells sampled in the West Fork area had an average total phosphate concentration of 0.035 mg/1 P (about the same as for surface waters in general). However the average nitrate content of wells (0.104 mg/1 NO_3 -N was 26 fold greater than that of average surface waters. This could indicate that a rapid biological uptake of nitrate must occur when ground water surfaces and that the system may be more nitrogen limited than phosphate limited.

Considering the relatively low total dissolved solids (216 mg/1 average) and low nutrient concentrations it is obvious that the West Gallatin River is an oligotrophic stream.

The problem is to compute how much phosphate loading the West Fork and the West Gallatin could take before reaching our selected limit of phosphate concentrations of 0.10 mg/1 P.

A reasonable figure for the daily per capita excretion of P is 1.5 g. For a population of a 1,000 people a stream flow of 3.4 cfs would be required to dilute such input to 0.10 mg/1 P. This is within the range of streamflow required to dilute domestic sewage without creating objectionable conditions as cited by standard sanitary engineering texts (2.5 - 4.0 cfs/1000 people)

The minimum flow on the West Fork in 1971 was 12.3 cfs hence the number of people allowable with no treatment would be 2760. If 90% phosphate removal were achieved by sewage treatment 27,600 people would be allowable.

According to our best estimates the maximum guests per day during the peak ski seasons (Dec. 20-Jan. 1 and Feb. 1-Mar. 31) would be 7,000 in 1985. Summer season and spring and fall guests are expected to be 4,500 and 1,400 per day respectively by 1985.

In view of the intensive sewage treatment system described in the Big Sky of Montana Inc. Environmental Report it is difficult to foresee any eutrophication problems in the West Fork from domestic sewage.

In the report a statement was prepared for Big Sky by Morrison and Maierle Inc., the engineering consultants who have designed and engineered the sewer facility to be installed at Big Sky. This is quoted below.

"The Sanitary Sewer Collection System will collect sanitary wastes from both the Mountain and Meadow Villages and transport them to a single treatment facility located to the east of the "Meadow Village."

"The Treatment facility will consist of a series of three ponds and a filtration plant which will provide tertiary quality effluent. The first pond containing approximately 8 million gallons, will include mechanical aeration equipment to provide proper oxygenation of the wastewater for good biological treatment. The second pond with a capacity of approximately 50 million gallons will serve as a holding pond to store winter wastewater flows following biological treatment in the Aeration Pond. From the storage pond the water will be sand filtered and chlorinated before discharge to the final pond. The water in the final pond will be of tertiary quality except for nutrient removal. Water will be pumped from the final pond for sprinkler irrigation of the golf course during the growing season. The golf course irrigation requirement will normally exceed the wastewater flows

thus requiring supplementation from the West Fork. With proper dispersal of chlorine, the final pond will be used to grow fish."

As far as the West Gallatin is concerned the lowest observed flow of the West Gallatin since records have been kept at the mouth of the Canyon was 226 cfs. With an even dispersion of people, 66,000 people would be allowable in the Canyon with no sewage treatment before total phosphate would be greater than 0.10 (mg/l P) with 90% phosphate removal 660,000 people could be accommodated.

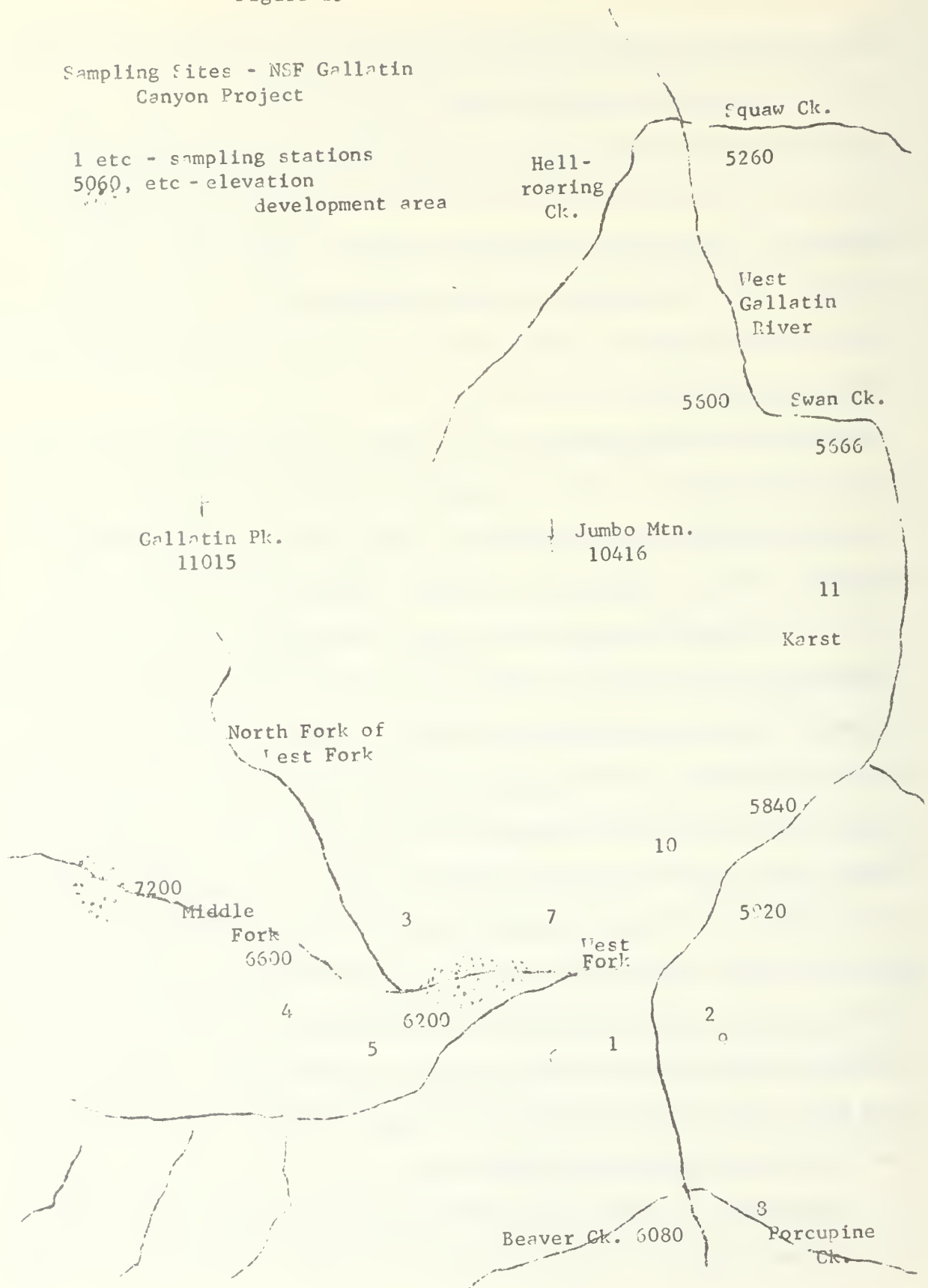
According to the results of soil survey data the private land available for development in the Canyon amounts to 2800 acres (exclusive of Big Sky). The criteria for classification of this land into this category is as follows: less than 15% slope, no severe limitations for septic drain-fields, no severe limitations for building foundations. If we project one residence per acre (assuming a family size of four) this intensive residential use would result in a population of 11,200. Assuming a sewage concentration with a BOD 7280 mg/l and 200 liters of domestic waste per day (50 gal) this would amount to a phosphate loading of 16,352 kg P per year. Interestingly enough if one assumes the present number of elk of 2185 residing year round in the canyon and that the composition of their manure is similar to cattle this herd would be adding 10,519 kg P to the watershed per year. Considering only the present resident population of the Canyon their present input of phosphorus would amount to 243 kg a year. It would therefore appear that for some time in the future the largest input of phosphorus that may end up in surface may be from elk, not people.

The survey of aquatic invertebrates has been carried out according to the plans submitted. Sampling stations are shown in Figure 15. At this

Figure 15

Sampling Sites - NSF Gallatin
Canyon Project

1 etc - sampling stations
5060, etc - elevation
development area



time all of the samples have not been analyzed so that only general conclusions can be drawn at this time. Table 8 gives the ordinal breakdown of samples taken one year apart: September 1970 and September 1971. Generally, we would not expect any great changes to be apparent between these samples since no great changes have occurred in the area. There is one exception to this generality: Station 9 is on a side channel of the West Gallatin River which drains a rapidly developing area and this station may be showing signs of eutrophication. Breakdown of all samples to taxa will be completed by June 1972. It will be possible at that time to have statistically sound data with which any future changes can be compared. From the data secured to date, there are several conclusions to be drawn. First, the West Fork and West Gallatin are comparatively poor streams in terms of nutrients. They do not support a high population of invertebrates and consequently, any enrichment added in the form of sewage effluent should bring about an increase in invertebrates. Second, the increase in invertebrates may not be desirable if Diptera replace Trichoptera, Plecoptera and Ephemerida - the situation which often occurs in advanced eutrophic conditions.

The types of changes which are now occurring in the development of the area are those associated with construction activities. Large areas have been cleared of vegetation, roads are being built, bridges constructed and streams diverted. These kinds of activities will result in siltation and possible drastic local effects on streams.

An outline of the proposed activity for the coming year is:

1. Maintain collecting at the present stations at three to four month intervals. If and when human populations begin to enter the area, then more frequent samples will be taken.

2. Use the released time from the above activity to concentrate on the areas subject to the mechanical disturbances of construction.

Table 8

Insects Collected in 1 month of 1970 and 1971

Station No.	<u>September, 1971</u>					Station Total
	Tricoptera	Ephemeroptera	Plecoptera	Diptera	Other	
1	77	211	22	44	8	362
2	61	98	51	57	10	277
3	62	265	64	15	20	426
4	68	259	56	23	7	413
5	63	284	62	69	12	490
6	34	201	17	37	4	293
7	174	386	25	71	15	293
8	17	191	41	69	8	326
9	5	69	130	298	20	522
10	216	233	27	97	6	579
11	<u>205</u>	<u>43</u>	<u>51</u>	<u>160</u>	<u>8</u>	<u>468</u>
Total	982	2,240	546	940	104	
Station No.	<u>September, 1970</u>					Station Total
	Tricoptera	Ephemeroptera	Plecoptera	Diptera	Other	
1	80	394	23	106	11	614
2	81	97	34	63	5	280
3	68	533	132	4	10	747
4	110	474	141	36	45	806
5	83	319	28	13	12	455
6	53	483	25	45	8	614
7	214	174	5	67	11	471
8	139	203	89	125	4	560
9	250	48	196	112	4	610
10	470	235	38	98	4	845
11	<u>208</u>	<u>52</u>	<u>69</u>	<u>141</u>	<u>5</u>	<u>475</u>
Total	1,756	3,012	780	810	119	

Sampling of surface waters of the West Fork and the West Gallatin in the Canyon was continued this past year on a more infrequent basis than formerly (alternate weeks during the summer and monthly during the winter as weather and travel allowed). Sampling of most of the wells studied the previous year was continued and additional sampling sites in the West Fork area were added as new wells were developed. The locations of the surface water and well sampling sites in the West Fork area are presented in Figure 16. The relationship of a number of these sites to important resort developments and activities should be noted. Some additional wells were included lower down in the Canyon (Beckman Flats area) to provide further baseline information about other locations where substantial satellite development will probably take place.

This year, fewer sites were sampled on the West Gallatin in the Canyon because of the uniformly high water quality observed in previous studies. Those sites sampled were selected because of their locations relative to important feeder streams or areas of actual or potential development along the West Gallatin itself. Table 9 indicates the sites included in the present program.

Because of delays in construction at the Big Sky Resort area, surface water quality data continued to be essentially baseline information which corroborated findings from the previous year that the waters of the West Fork and of the West Gallatin are of high quality. From a microbiological viewpoint, the only noticeable change was a lowering of coliform counts in the West Fork probably due to the removal of some 400 head of cattle and horses from the drainage.

This latter phenomenon is similar to that observed in the Bozeman Creek

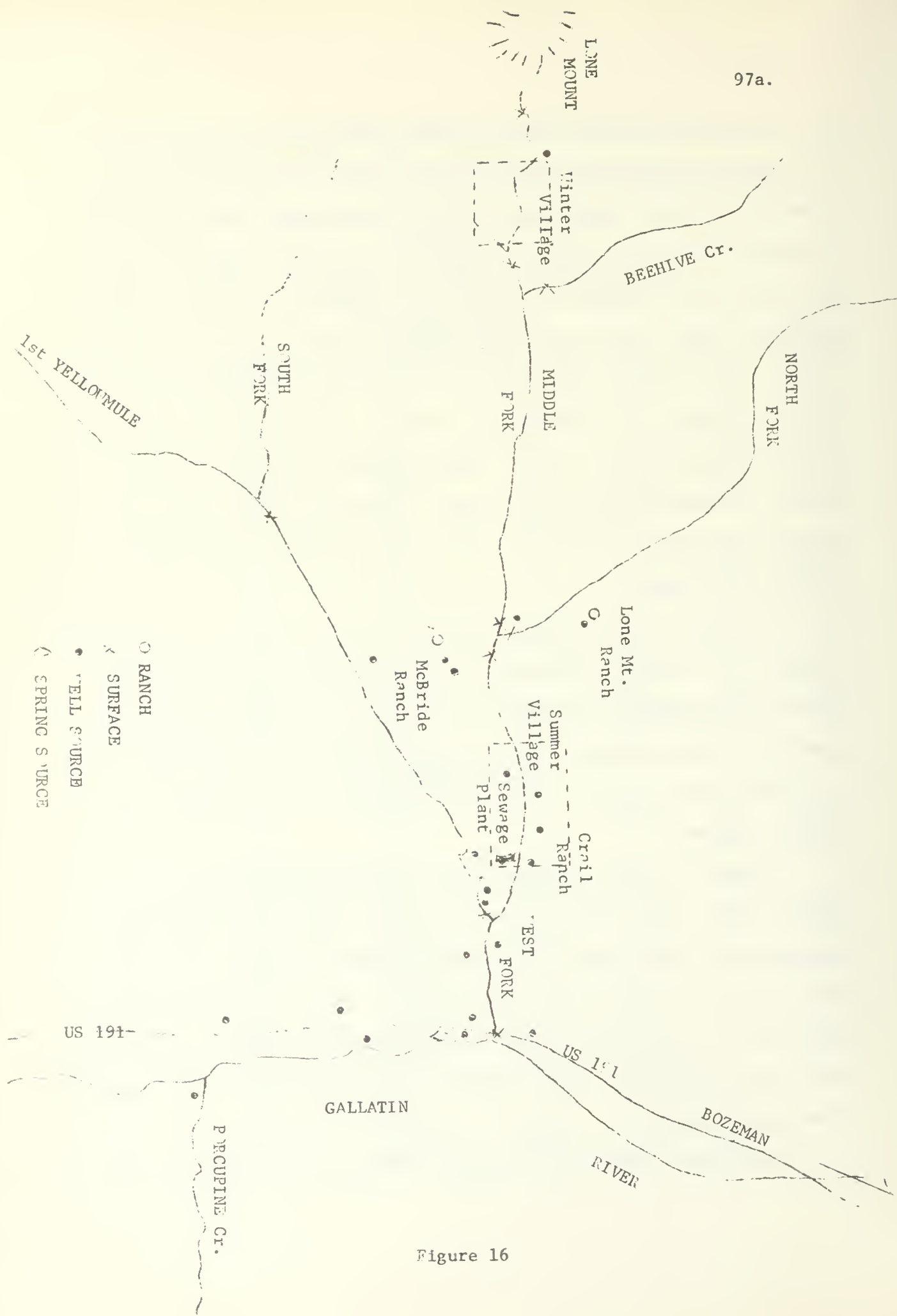


Table 9

Surface Water Sampling Sites on the West Gallatin River
in the Canyon

<u>Sample No.</u>	<u>Description</u>
WG1	First bridge at mouth of canyon: R4E,T4S,S4
WG2	Squaw Creek bridge: R4E, T4S, S28
WG3	Squaw Creek at church camp bridge: R4E, T4S, S33
WG4	Above Beckman Flats: R4E, T5S, S4.
WG5	Second bridge over West Gallatin, Cascade Creek: R4E, T5S, S15
WG6	Below Greek Creek Campground: R4E, T5S, S24
WG7	Swan Creek at Highway 191 bridge: R4E, T5S, S25
WG8	At upper end of Buffalo Flats Campground: R4E, T6S, S1
WG9	New bridge over West Gallatin (across from Gilmer) R4E,T6S, S23
WG10	At Jack Smith bridge: R4E, T6S, S27.
WG11	Below Cameron Flats, above Michener Creek and Springs R4E,T7S,S5
WG12	Above Cameron Flats, below Beaver and Porcupine Creeks, Mile 46 R4E,T7S,S9
WG13	Below Rainbow Ranch R4E, T7S, S28

Drainage when an elk herd, of approximately the same size was driven out of the area by an extensive logging operation. This indicates that such phenomena are measurable in various drainages, that such data are applicable to other areas, and that certain predictions can be made on these bases. One such prediction is that if enough people take to the trails and to snowmobiles in the West Fork area without proper sanitary facilities being provided, coliform counts could rise again and the possibilities of health hazards might be correspondingly increased. We believe that, with the help of the modeling group, we will be able to predict how many people it would take to cause a problem of this kind.

Chemical analyses on these surface waters have not changed significantly in the past year as compared to the first year's results nor would they be expected to with the minimal construction and development activity taking place in the West Fork area. The chemical data gathered on the West Gallatin samples also indicate no significant changes taking place. These data on chemical characteristics of surface waters are also being used by those interested in eutrophication, aquatic invertebrates and fishing studies.

A very evident and objectionable occurrence in West Fork and West Gallatin water was the slugs of turbidity and sediment generated by construction activity (highway construction from U.S. 191 to the Meadow Village, sewage plant and golf course installations). These intermittently occurring incidents were noticed and criticized by both residents and tourists. Sediment and turbidity, in addition to being aesthetically objectionable, can affect stream life and fishing productivity (and satisfaction). Because of the intermittent nature of these "muddy water" incidents, it was not possible to provide a time accounting of their occurrence or a determination of the loads of suspended solids by quantitative procedures.

Studies on wells and springs indicated that there were no problems with sanitary quality of ground water in enclosed and self-contained systems. In new installations, chlorination was found to eliminate contamination of sanitary significance. Chemical analyses on samples from these same sites provided no evidence of any unsatisfactory conditions related to sanitary quality. Several new wells located on Big Sky property have been placed under study including one at the Lone Mountain Ranch and one supplying the central distribution system for the lower village. A number of others immediately adjacent to Big Sky property are also under test currently. Studies on the

latter will be particularly useful in the future as we begin to evaluate the impact of the sewage disposal system on the quality of both surface and ground waters. Data obtained on wells at several locations along the West Gallatin both upstream and downstream from the West Fork area do not show any indications of pollutant infiltration due to increased development or human activities.

With regard to our efforts for the coming year, we recognize some areas where information is meager or lacking entirely. A thorough surveillance program on suspended solids in both the West Fork and along the West Gallatin is necessary to measure the effects of construction activities and other land management practices on this parameter of water quality. This information will be particularly useful in the projects dealing with aquatic ecology, fishing activity, soils-geology problems related to erosion and the sources of sediment, and satisfaction evaluations relating to human behavior.

Baseline data are needed on heavy metals, pesticide and herbicide residues in the stream system so that the effects of future uses of pesticides, herbicides, and fungicides may be properly evaluated. Control of insects (mosquitoes and biting flies) will be necessary to maximize recreational satisfactions, control of weeds and fungi (snow mold) will constitute a golf course management problem. The residuals of insecticides and heavy metals should be determined in the West Fork drainage particularly because of previous agricultural activity.

Even though biodegradable or "soft" detergents are very widely used, their rates of decomposition are relatively slow in cold oligotrophic waters; and therefore tests for their presence should provide evidence of direct contamination of streams with raw or improperly treated sewage. Some detergent

analyses on routine samples taken as the sewage treatment plant begins operation and spot samples at critical locations should provide both baseline data on the resort treatment facility and some direct evidence of how well sewage is being handled in individual situations.

The completion of the sewage treatment facilities and their subsequent operation as the result of the sale and occupancy of many condominiums and the initiation of business activity in the lower village will require some close bacteriological and chemical monitoring of the West Fork to determine the efficiency of the treatment process. Not only is there some necessity to evaluate the erratic performances inevitably encountered during the mechanical shake-down period and during the early periods leading to a stabilization in the operational characteristics of the system, but there will be a need to evaluate the "steady state" performance of the process to determine whether technical aspects of installation and operation do result in the designed capacity and efficiency of treatment.

As the sewage lagoons begin to fill, the wells in the area must be monitored to determine what is happening to the ground water and because of certain geological conditions what is happening to the streams during base-flow periods particularly. This work is similar in concept to that in which migrations of bacteria and chemicals in septic tank drainage fields are being studied as a function of soil type and structure. Clearly, these data are of great interest to health department personnel in the establishment of regulations and specifications; and further, these data can be widely applied in other areas of the country.

Whereas the past two field seasons have produced water quality data essentially of a baseline nature, the same will not be true during the coming

year. The development of the upper village ski facilities depend on the upgrading of the present road, if not the building of a new one. As indicated previously the activation of the sewage treatment plant, and mushrooming developments along the West Gallatin River are providing factors which will force changes in water quality. Close and careful monitoring will be necessary to follow the anticipated alterations to the patterns previously observed.

The large amount of data being generated by other subprojects make it possible to begin estimating what will happen to water quality in the Gallatin Canyon as a result of the Big Sky development. The geology, soils, climatology and hydrology projects are providing basic information as to what physical constraints are in force governing both water quantity and quality while the vegetation and game studies are telling us what the biological contributions are to both protecting and decreasing water quality.

The economics project is generating some numbers indicating how many people can be expected to come into the area, what they will probably be doing, and how much money they will be spending. The sociologists are discovering people's attitudes concerning the issues involved with the development of the Canyon and what the possibilities are for organized planning for the area. Our new political scientist will be investigating public policies concerning the area and what governmental constraints might come into play.

All of these data have a bearing on the amounts and placing of waste loads that will be generated in the Canyon and how much willingness and money there will be available to properly take care of these wastes. If the overall situation is wisely handled, many people can come into and enjoy the Canyon

without degrading water quality in terms of health or recreational enjoyment, which will cycle back and make the Canyon more popular.

With all of these various projects working together and contributing data and concepts to the systems group of the many interactions involved, we will develop alternatives for managing the "happenings" in the Canyon for the common good of the ecology of the area and of the majority of the people involved.

The upper 45 miles of the West Gallatin River in Montana is classified as a stream of national as well as state-wide value. It is one of only eight streams receiving such recognition in Montana. Recreational fishing on this part of the river has increased considerably during the past several years. Proposed recreational developments are expected to greatly increase fishing pressure and may alter the physical, chemical, and biological characteristics of the river. The value of fishing to local residents is underlined by the fact that 74% of Canyon residents named fishing as their major leisure time activity. Fishing is equally important to hikers of whom 18% said they came to the Canyon primarily to fish, while an additional 40% said that while hiking in the Canyon they also engaged in fishing. Of a sample of hunters interviewed in the winter of 1971-72, almost three-fourths said that, in addition to hunting in the Canyon, they returned at least once yearly to fish. In fact, one quarter of all hunters said that fishing was their favorite outdoor recreation. It is virtually certain that with increasing fishing pressure, many fishermen will experience less success in their harvest, unless artificial stocking of the stream is increased to meet increasing demand.

During the 1971 season the fishery survey was conducted on two sections of the West Gallatin River. Section A begins at the Yellowstone National Park boundary and extends downstream 10.8 miles. Almost all of the river in this section is visible from the highway and is readily accessible to fishermen. Section B begins about two miles below West Fork and extends downstream 11.6 miles. Approximately 75% of the river in this section is visible. From the opening day of the fishing season (May 16) until June 13, fishermen were censused on weekends and holidays. From June to September 12, fishermen were censused a minimum of four days per week with the stipulation that all weekends and holidays be included. Selection of the week days was made from a table of random numbers.

The daily distribution of fishing intensity was determined by counting fishermen at eight, ten, and twelve a.m. and two, four, six, and eight p.m. All counts were made as rapidly as possible from a vehicle and only individuals who were actually fishing (with rod in hand) were counted.

As many fishermen as practicable were interviewed from 10 a.m. to dark to obtain length of time fished, total number in the fishing party, the gender and residence of each individual, and the species, number, weight, and total length of fish caught. Scale samples were taken from some wild fish for age distributions.

Return-addressed and stamped census cards were given to fishermen (or parties) that indicated they would continue fishing after the interviews. Numbers on cards corresponded to numbers on interview forms. Information requested on census cards included the party, fishing time, and number of trout caught and number released.

For the last month of the census period fishermen were also asked to

return an expenditure questionnaire. Information requested included: occupation, annual income, activities in Canyon in addition to fishing, expenditures on the fishing trip in the Canyon, time spent on the fishing trip, and comments on their stay in the Canyon.

Turbidity measurements were made each census day at seven stations as follows: one each on the river at the beginning and end of the study sections, and one each on Taylor Fork, West Fork, and Porcupine Creek.

A total of 11,000 hatchery rainbow trout were planted in the river in July. All of these fish were marked by clipping the adipose fin so they could be distinguished from wild fish.

A total of 1,212 parties involving 3,867 individuals were interviewed. About 50% of the parties returned their census cards. The average number of persons per party was 3.19 but the average number of fishermen per party was 2.17. Of the 2,634 fishermen interviewed, 66% were males, 17% females and 17% unlicensed juveniles. In Section A, 44% of all individuals interviewed resided in Gallatin County, 13% in other parts of Montana, and 43% out-of-state, while in Section B the percentages were 46%, 16%, and 38% respectively.

Fishing intensity data were divided into week days and weekends - holidays. The data were further grouped into one of four strata, each covering about a four week period, to compare seasonal distribution patterns and to facilitate estimates. Angling intensity in hours was estimated by summing the daily distributions of fishermen in each stratum and constructing "fishing intensity curves". Total fishing pressure for any stratum thus became the total fishermen-hours under the period's curve. The total number of fishermen-days for each stratum was determined by dividing the total

number of fishermen-hours by the average length of the fishermen-day of that stratum. The average length of the fishermen-day for the various strata and sections ranged from 1.9 to 4.5 hours with the longer days generally occurring late in the summer.

The preliminary estimate of the total fishermen-days for 22.4 miles of the river was 4,713. The number of fishermen-days per mile of stream was 193 for Section A and 226 for Section B. These are minimum estimates considering that portions of the study sections were not observable. The Montana Fish and Game Department estimates of fishermen-days per stream mile for the Madison River in 1966 and 1967 were 490 and 590 respectively. Based on these comparisons the present fishing pressure on the West Gallatin River is not great, although it would be more comparable to that of the Madison River on a per acre of water basis. However 8% of the fishermen reported the fishing as poor, 3% as fair and 5% as good. The recorded catch of wild trout (mostly rainbow) was 3,584 and this was about 10 times the catch of hatchery trout.

Projected increase in the average number of fishermen-days per mile of study stream for the year 1975 ranges from 237 (assuming no Big Sky) to 286 (with Big Sky). Projections for 1985, are 321 (assuming no Big Sky) 517 (with Big Sky). Total fishermen-days per stream mile for Spring Creek (near Lewistown) were 635 (1968) and 534 (1969). Based on these comparisons the present fishing pressure on the Gallatin River is not great.

Predicting the effect on the fish population or fishing success assuming a 50 to 100% increase in the fishing pressure will not be possible from a short term study. However, some general thoughts based on the results of other studies include the following:

Total harvest is not directly proportional to fishing pressure as it is

modified by the vulnerability of the species, security levels as determined by the quality of the habitat and production or rate of turnover of the population. In general, yield increases with increasing fishing pressure but begins to taper off when surplus stocks are harvested. Biologically speaking, over-exploitation might be defined as the point where the total yield decreases in the face of increasing fishing pressure. Before this point is reached, two things usually happen. The average size (or age) of fish and the average catch per unit effort decrease. When these occur the fishermen and resort owner will consider the stream as "over fished" and will exert pressure on the Fish and Game Department to stock more hatchery fish or to apply more restrictive regulations.

Considering the entire river, it is not likely that the fish population will be over-exploited even with a considerable increase in the fishing pressure. Fishermen seemed to concentrate around campgrounds, bridges, and the more accessible areas. For example, in 1970 the upper 2.8 miles of Section A had 1.6 times as much fishing pressure as the lower 8 miles. This could cause local decreases in fishing success.

How many fishermen will other fishermen tolerate? Some local people already consider that there are too many. On the other hand, pictures of fishermen standing shoulder to shoulder on trout streams in California, New York, etc. make one wonder. The size and number of campgrounds and parking areas will partially limit the number of non-resident fishermen.

The West Gallatin River within the Canyon is estimated to be an intermediate stream in terms of fish production. A slight increase in nutrients could increase the production of fish food organisms. Benefits derived from this would be offset if resulting increased growths of filamentous algae

create nuisance conditions for fishermen. Should quantities of phosphates exceed $0.1 \text{ mg/l/PO}_4\text{P}$ the production of food organisms would probably decline. Increased development and use throughout the Canyon will probably result in increased sediment in the streams. In fact, a surprising number of fishermen complained about sediment in the stream during the 1971 field survey. Sediment could be detrimental to the production of food organisms and the reproduction of trout, particularly if the sediment increases occur during periods of normal flow.

The river in the canyon has a preponderance of "riffle" areas as compared to pool or "cover" areas. The lack of cover probably limits the standing crop of fish more than food production. With increasing Canyon use, we can eventually expect pressure to widen (perhaps to four lanes) the existing road, which would increase "riffle" areas and decrease "cover" areas. In our opinion, this could do more harm to the fish population than the increase in fishing pressure.

Of those fishermen censused, the vast majority (61%) indicated that they were not residents of Montana. It is interesting that non-resident fishermen reported a much higher fishing success than resident fishermen; non-residents reported (on the average) catching a total of 8.91 fish of which 3.91 were released. In comparison, resident fishermen reported catching 5.82 fish of which 3.02 were released. Gallatin Canyon fishermen were fairly affluent, with only 27% reporting annual incomes of less than \$10,000. In comparison, an additional 38% reported earning more than \$15,000 annually. As a group, non-residents had much higher incomes than resident fishermen. For example, 68% of the non-resident fishermen reported earning

annual incomes in excess of \$15,000, compared to only 15% of the resident fishermen who reported similar incomes.

Non-residents also reported spending substantially more money than resident fishermen during their stay in the Gallatin Canyon. Average expenditures of non-residents reporting over-night stays in lodges or motels was \$539.16. In comparison, resident fishermen who were just "passing through the Canyon" reported spending only \$4.69. Residents who went to the Canyon to picnic or to tent or trailer camp reported spending the smallest sums while among non-residents, small expenses were associated with tent camping, trailer camping and "passing through the Canyon". For all expenses, the average spent by all groups was \$143.30. Among non-resident fishermen, the most popular overnight accommodations were motels or dude ranches with 31% of the non-residents reporting such accommodations. In comparison, the majority of non-residents reported overnight stays in public trailer camps (27%) while an additional 26% of the non-resident fishermen said they spent only the day in the Canyon. Picnicking and tent camping were likewise significantly important recreation activities of fishermen. (Table 10.)

Non-resident tent campers reported staying the longest in the Gallatin Canyon with the average reporting a stay of 10.8 days. Non-residents staying in motels or dude ranches reported the second longest stay in the Canyon (6.8 days). Among resident fishermen the longest stay reported by any group was 2.7 days reported by tent campers.

Fishermen in the Gallatin Canyon engage in a variety of other recreational pursuits as well. Sixty-six percent of all fishermen reported that one major activity in which they engaged was sight-seeing. Thirty-three percent of all fishermen said they hiked and an additional 31% reported

Table 10
Lodging of Fishermen

	Resident		Non-resident		Total	
	Numbers	%	Numbers	%	Numbers	%
Motels, Dude Ranchers	10	16.3	30	31.2	40	25.3
Public Trailer Camp	17	27.4	20	20.8	37	23.4
Private Trailer Camp	1	1.6	6	6.2	7	4.5
Tent Camping	3	4.8	9	9.4	12	7.6
Transient	16	25.8	6	6.2	22	13.3
Visiting	1	1.6	9	9.4	10	6.3
Picnicking	6	9.7	14	14.6	20	12.7
Canyon owner	8	12.9	0	0.0	8	5.1
Unknown	0	0.0	2	2.1	2	1.2
Total	62	100	96	100	158	100

picnicking while in the Canyon. Twenty-six percent also said they trailer camped and an additional 25% said they visited while in the Canyon. Thirty-nine percent of all fishermen reported engaging in photography while fishing or staying in the Canyon. A study of hikers in the Spanish Peaks revealed that one-half of all hikers also reported taking pictures while hiking in the Spanish Peaks. It appears from these data that Gallatin Canyon fishermen do not enter the Canyon merely for fishing, but rather engage in a multitude of other recreational pastimes during their visit.

The esthetics of the Canyon are also an important feature in its attraction to recreationists. Approximately one-half of all Canyon fishermen commented on the "beautiful Gallatin Canyon scenery". These remarks were made in response to a question "Any other comments you would like to make?", so the very high frequency of "scenery" comments is surprising. An additional

nine respondents, or roughly 5% of the sample, made unfavorable comments regarding the scenery in the Canyon. In fact the aesthetics of the Canyon seemed to be a major drawing card for recreationists. In a study of travelers through the Gallatin Canyon, 69% said that the scenery and beauty of the Canyon were the things they liked most about their trip through the area. Likewise among snowmobilers interviewed during 1971-72, 28% responded that the scenery was the thing they most liked about their trip through the Gallatin Canyon. 53% of the hunters also noted that the scenery was the most enjoyable thing about hunting in the Canyon.

The beauty of the Gallatin Canyon and its reputation as a scenic drive are well known to local residents and out-of-state tourists. Present Gallatin Canyon property owners indicated that their reasons for buying property in the Gallatin Canyon were primarily based on a desire to have a place for relaxation in a rustic atmosphere. They named things such as the beautiful scenery, good hunting and fishing, and solitude as their major reasons for seeking recreation in the Gallatin Canyon. Sight-seeing was also one of the frequently mentioned recreational pastimes of Canyon residents. The Gallatin Canyon is narrow and U.S. Highway 191 is pretty well confined to the river bank. This "scenic corridor" is a critical and important factor in the perceived aesthetic beauty of the Canyon according to residents and recreationists. There is some talk about trying to obtain a scenic highway designation for this stretch of U.S. Highway 191. We believe it is a reasonable hypothesis that the existing volume and character of travelers throughout the Gallatin Canyon are less than the area can tolerate and still preserve its aesthetic attractiveness. Continued measurement of changes in traffic volume and character, fishing pressure, and fisherman success, coupled with the monitoring

of recreation or user preference and satisfaction, should promptly alert us to current and prospective indirect benefits and costs of recreation development.

Human impact on big game animals is a topic of considerable local concern, and one which has significant implications for other semi-primitive regions. The Gallatin River drainage is inhabited by one of the largest elk herds (2,000 animals) in the U.S. The herd is hunted from mid-September to early December and is a major recreational and economic asset. The management problem associated with attempting to maintain the elk herd at a level compatible with the ecosystem has been the subject of a nearly continuous controversy between the Montana Fish and Game Department and local residents since approximately 1900. The management policies of the involved public agencies (Montana Fish and Game Department, U.S. Forest Service, and National Park Service) are greatly affected by availability of information to support a given management action. Just this last December, the controversy again became public when a special elk season was held to harvest the excess game animals. During the past year the project research team has attempted to assess the economic value of consumptive use of the elk and attempted to project economic benefits which might be derived from future non-consumptive uses.

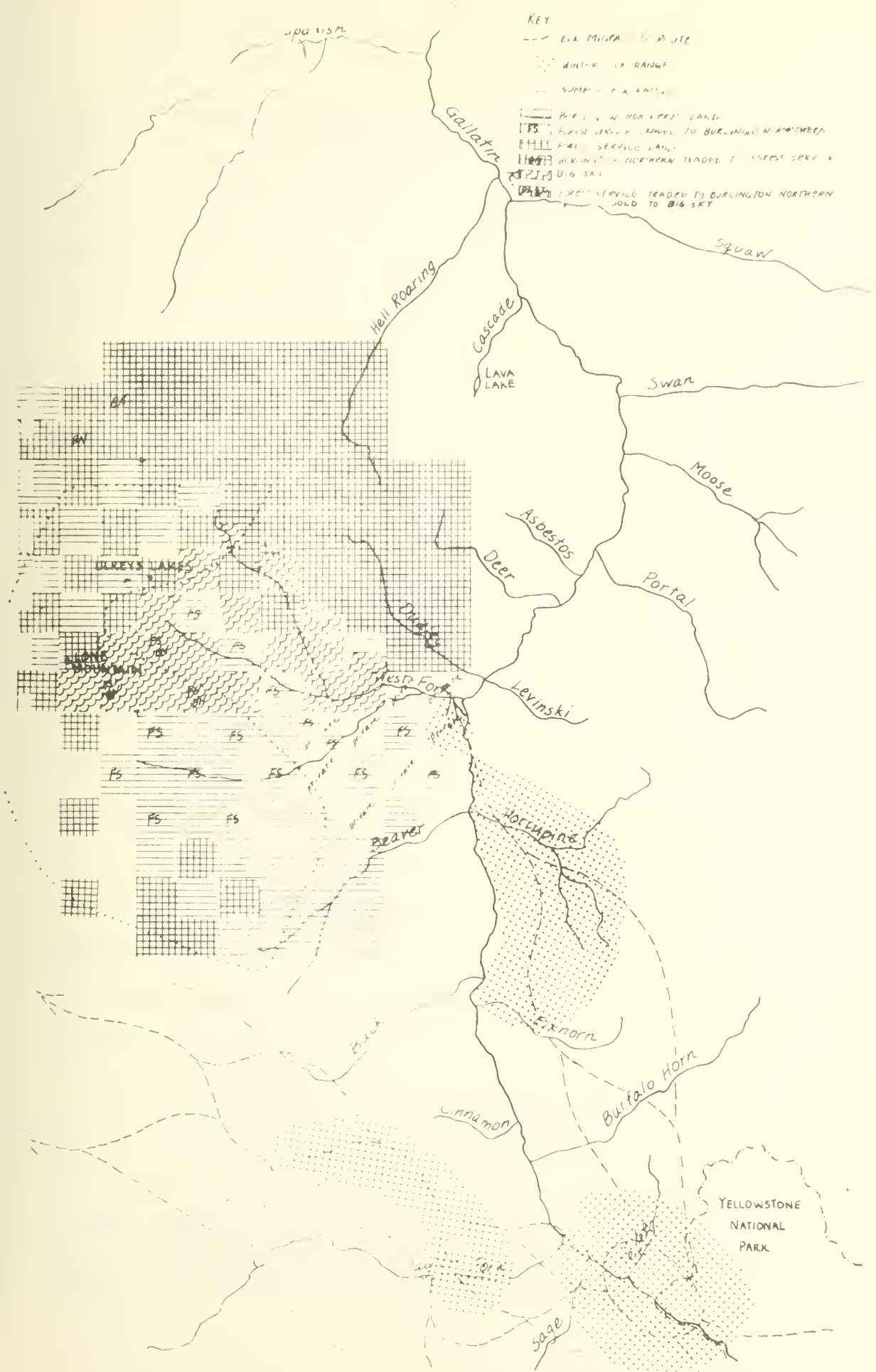
The elk population of the West Gallatin drainage can be divided into general sub-populations which are probably more or less distinct, although considerable interchange between the sub-populations is likely. The largest of these sub-populations is undoubtedly the Yellowstone Park migratory herd which resides south of the north ridge of the Porcupine drainage-Yellow Mule Ridge areas. A second sub-population occupies the West Fork and Jack Creek

drainage. A third sub-population is found on the northern aspect of the Spanish Peaks. A fourth sub-population occupies the Gallatin range north of the Procupine drainage. Because the Yellowstone Park herd is the largest and most controversial locally, most of the data generated over the years applies specifically to it. The locations of the winter range of the Yellowstone Park herd and its migratory routes and the summer range of the West Fork and Jack Creek herds as related to land ownership in the West Fork area is shown in the attached figure.

In the study area, each section of land was classified as to the type of access to the section. About 41% of the sections in the study area can be driven into during dry weather with four-wheel vehicles. Access to about 15% of these potentially accessible sections is partially or entirely restricted by land owner posting.

The road accessible sections were not generally used by elk during the summer of 1971. Several hypotheses can be offered for absence of elk in apparently suitable areas. Altitude and disturbance factors probably have some effect. Frequent human disturbance particularly in the Middle Fork of the West Fork drainage was undoubtedly of significance. It appears possible that the West Fork herd segment has increased in the last several years due to a change in hunting seasons in the west (Madison slope) of the mountain area. The elk may not yet have fully invaded all suitable areas from which they might have been displaced by recent logging activities. Abundant elk tracks were observed in late November (during hunting season) in logged-over terrain in the Beaver Creek drainage.

Hunters in the Gallatin Canyon were usually residents of Bozeman or the Gallatin Canyon, more likely to be craftsmen or foremen, unskilled



KEY

- ELK MTS. ROUTE
- ... WINKLER RANGE
- ... SUMMIT PARK AREA
- [Symbol] BURLINGTON NORTHERN LAND
- [Symbol] FOREST SERVICE LAND TO BURLINGTON NORTHERN
- [Symbol] FOREST SERVICE LAND
- [Symbol] BURLINGTON NORTHERN TRADED TO FOREST SERVICE
- [Symbol] U.S. NAT.
- [Symbol] FOREST SERVICE TRADED TO BURLINGTON NORTHERN
- [Symbol] U.S. NAT. TRADED TO BURLINGTON NORTHERN

YELLOWSTONE
NATIONAL
PARK

workers or students; usually hunted every year; the majority were under 35 years of age and had been hunting most of their lives (20 years or longer); most had completed high school, but not college; almost all were hunting elk although an additional 1/3 also hunted deer, and the vast majority had annual incomes of less than \$10,000.

The majority reported spending less than \$20.00 on the hunting trip although the range of expenditures was very broad, with the few reporting expenses as much as \$1,150.00 or more, and a few reporting no expenditures. Most hunters stayed in the Canyon less than 24 hours. The majority said they hunted in areas other than the Canyon, that they preferred to hunt elsewhere, and most hunters did not get an animal while hunting in the Canyon; even among those hunters who were successful, the majority reported a preference for hunting elsewhere. In spite of these preferences, most Gallatin Canyon hunters said they had hunted in the Canyon in previous years, and that they intended to return to hunt during the coming year. A total of \$332,673 was estimated to have been spent locally during the early bull elk and regular elk seasons. This amounted to an expenditure of \$1,087 per elk. Capital equipment and non-resident travel expenditures were not included. These hunting seasons furnished 11,446 hunter days of recreation of which 1,115 were credited to the 150 square mile area immediately surrounding the Big Sky development.

Most Gallatin Canyon hunters knew the Chrysler Resort Complex was being built in the Canyon, and the vast majority said they thought it would have an adverse effect on the environment. Hunters thought the resort would bring too many people to the Canyon, and that there would be fewer animals as a result. Among the adverse impacts anticipated, hunters cited more residents,

more traffic, and pollution. Only a small minority of hunters expected positive effects from the resort development (i.e., better recreation, improved economy, more businesses). Many hunters reported returning to the Canyon monthly or weekly to engage in other Canyon recreation activities, such as fishing, sight seeing, hiking, camping and picnicking. However, the vast majority said their favorite outdoor recreation activity was hunting, and an additional one quarter of the hunters said fishing was their favorite activity. Because of the generally low incomes of many hunters, it is questionable that this group of recreationists could obtain comparable recreation experience through purely commercial recreational developments.

The majority of hunters said that the scenic quality of the Canyon was the single most important reason that they chose to hunt in the area. Other commonly mentioned reasons for hunting in the Canyon were its proximity to home, and the fact that they were familiar with the area. The number of animals, accessibility of game, and the success of the hunt were not commonly mentioned reasons for hunting in the Canyon. The majority of hunters said the most important reason they hunted was for the outdoor recreation experience, for the challenge or sport of it, and to obtain wild meat. It appears that the single most important characteristic of a really good hunting experience is to enjoy the scenic country. Other elements of good quality hunting include seeing lots of animals, getting an animal of good quality, avoiding other hunting parties, and enjoying good companionship while on the hunt. Weather conditions and accessibility to the area were not frequently mentioned as elements of a good quality hunting experience.

We are beginning to develop a hunter quality index which will quantitatively evaluate the significance of each of the above mentioned variables,

as well as evaluate other aspects of the hunt. These additional hunting characteristics will include the following:

(1) The Demand Supply Index. This is an expression of the assumption that the demand for hunting a game species in a given area is dependent upon the rarity of the species, the hunting population to draw from, and the hunting success.

(2) Hunter Area Index. This is an expression of the amount of hunt-able terrain available for each hunter. The area is adjusted for weather conditions and the actual habitat of the animal.

(3) Hunter Success Ratio. This is the ratio of success during the current hunting season with the minimum tolerable level of success for the species. Minimum tolerable level of success is that degree of success below which hunters will not return to hunt in the area.

(4) Wilderness Hunting Quality Index. This is determined by multiplying the hunter quality index by the percentage of roadless huntable sections in the hunting area.

The hunter quality indices together with the economic data and aesthetic and social data will provide tools for measuring the social costs and benefits of consumptive as well as non-consumptive elk uses in the Gallatin Canyon. It is acknowledged that the Gallatin Canyon area is relatively unique in that there are only five other areas in Montana which have an elk population of comparable size. The Gallatin elk population is one of the twenty largest populations in North America.

The Gallatin furnishes about 6% of the elk hunting in Montana. Hunter success ratios for nearby hunting areas suggest that they are equally saturated, and diversion of hunters to these areas through closure of the Gallatin

would degrade the hunting in these areas also. It is estimated that diversion of the Gallatin hunters into nearby hunting areas would lower the average hunting success in these areas by 7%.

The study of non-hunting use of the Gallatin big game herds is just beginning. It has been publically proposed that hunting be eliminated in favor of non-hunting use and a program of artificial feeding be used to maintain the herd. The scientific literature bearing on the subject indicates that artificial feeding is an ecologically and economically unsound management approach. The social costs and benefits of displacing consumptive with non-consumptive elk uses are being studied and are a vital measure in this cost-benefit analysis. Likewise, the generalizability of these findings will be of considerable benefit where similar resort developments are proposed.

Additional aerial and ground surveys will be conducted to obtain a more accurate estimate of the big game population of the heavily timbered areas and to allow the identification of specific sites critical to the big game population. This will allow a detailed projection of the impact of development on the lands involved in the land trade. The techniques for appraising the uniqueness of the area and for mitigating development impact on wildlife will be of use elsewhere. The hunting quality indices permit the comparison of this area and time with other times and places. The economic and sociological surveys of hunters will continue. Now that the basic techniques have been proven, additional emphasis will be given to a study of non-hunting wildlife use. Comparison information from portions of Yellowstone Park is also being gathered to aid in interpretation and

extension of the Gallatin data. The botanical and geological studies will be of considerable use in producing high quality projections of the effect of land development and the construction of the Big Sky - Ennis road on the wildlife and wildlife user populations of the West Gallatin drainage.

During the summer of 1971 a current vegetation map covering 100 sections of the Spanish Peaks - Big Sky area was constructed from 1970 JR and 1962 B + W aerial photographs, USFS 1960 inventory, current records, 1969-1971 surveys, SCS records and the investigators own field work. (See appendix).

With the exception of the Spanish Peaks Wilderness, practically all of the land shown on the map is now privately owned (47 acres). The major access to the Spanish Peaks is now, as it was in the past, under private control having been purchased by Big Sky. However, Big Sky has granted easements to the United States for Trail No. 16 through Bear Basin and Trail No. 40 through Beehive Basin according to the agreements reached in land trades 2 and 3. The trails may be relocated at the expense of the United States if the present location is needed by Big Sky for permanent improvements.

As an adverse environmental effect which cannot be avoided, the United States stated in the Final Environmental Statement, Gallatin Exchanges No. 2 and 3: "The location of Big Sky so close to the proposed Spanish Peaks Wilderness will probably put an additional load on the wilderness resource. However, the Forest Service has the responsibility to protect this resource and when it is endangered protective measures will go into effect. This could include limiting the size of parties, permit systems, and limiting access. This is some time off, but will occur eventually with or without the land exchange".

The major forest type in the area is lodgepole pine. Fire has played an important part in the establishment of lodgepole pine forests. The large extensive stands of pole size and timber size trees have originated from at least two separate fires. The small areas of seedling and sapling size lodgepole are in part due to regeneration from logging operations and in part due to recent fires.

Substantial portions of Section 19, T.7S, R.2E and Sections 21, 27, 29, and 34, T6S, R. 3E have been clear-cut, mostly for lodgepole before Big Sky purchased the property. In the act of harvesting the timber, the land was left in a highly disturbed state. The "slash", crisscrossing of roads, erosion and general total disturbance of the forest environment have left these lands in a state where they are unsuitable for any other use. Big Sky has contracted to have these lands cleared, restored and replanted. As succession proceeds on these lands as well as the seedling-sapling size stands, a favorable habitat will be created for wildlife, particularly for deer.

On the other hand approximately 20 ^{sections} ~~acres~~ of lodgepole pole and timber size forest will not be logged. This represents a definite economic loss to the local area. With proper harvesting methods it is possible to log lodgepole pine in such a manner that havoc is not created. Cessation of logging in this area represents a definite economic loss to the local lumber industry.

Furthermore the species is extremely susceptible to the mountain pine beetle (Dendroctonus monticolae), epidemics of which have wiped out thousands of acres of trees. Dwarf mistletoe (Arceuthobium americanum) is widespread throughout the lodgepole pine type and causes a large but as yet

undetermined amount of growth loss. Because of its prevalence in the lodgepole pine type, silvicultural management of the species must be positively geared to its control. It is particularly susceptible to windthrow on many sites and presents an increasingly greater fire hazard as the stands become overmature. In view of these factors and its successional status it is difficult to defend protecting this species from timber harvest. The species is also susceptible to a number of diseases.

According to Part I of the Gallatin National Forest Multiple Use Plan: "In 1966, when the inventory for the latest Timber Management Plan was completed, there were 688,826 acres of commercial forest land. Of this total, 577,300 acres were considered as operable commercial forest land.. The calculated annual allowable sell was 56 million board feet of saw-timber and 32.5 million cords of other products. Annual mortality due largely to insects and disease, was estimated to be 33 million board feet. Net periodic annual growth was estimated to be 18 million board feet, or a net loss of 15 million board feet per year. The plan also pointed out that 65 percent of the commercial forestland is mature and overmature saw timber."

However as far as the West Fork area goes there seems to be quite definite constraints on logging of lodgepole pine. By comparing the portion of the West Fork in which there was common map coverage of vegetation, soil, and geology, a number of interesting correlations emerged. The area was divided into 1/4 sections and each stand of a particular vegetation type was correlated with the soil association and geology (both surficial and bedrock).

Table 11 compares stands of vegetation with the geology of the area. The most commonly occurring site of lodgepole pine was on a landslide

Table 11

Number of Vegetative Stands Occurring on
Various Surficial and Bedrock Geological Units

Geology	Vegetative Type						
	Lodgepole Pine	Douglas Fir	White Bark Pine	Meadow	Sagebrush	Willow	Total
Landslide Deposits	53	5		5	7		70
Glacial Deposits	46	4	4	6	2		
Undifferentiated Colorado and Montana	42	17	4	4	2		
Undifferentiated Kootenai and Jurassic	22	4	9	3			
Colluvium	19	10	1	6	3		
Coarse Stream Gravels	4		1	2	13	5	
Madison-Morrison Limestone	1	2	3				
Rock Fall Debris	1	4	1				
Undifferentiated Pennsylvanian and Triassic		2	6		1		
Stream Deposited Silt				1			
Glacial Meltwater Deposits				1	6		
Stream Deposited Silt						2	

deposit practically all of which overlie undifferentiated Colorado and Montana shales and sandstones. The stability of these slides is threatened by any disturbance. An example is the slide that is now active in Section 27, T.6E, R.3E as a result of complete clear cutting and construction of the logging road across the slide that was stable before logging. A large number of stands of lodgepole pine occur on glacial drifts overlying shale and on shallow soils derived from shale. The other vegetative types, with the exception of white bark pine and willows also occupied slide deposits but are not so extensive and are much less frequent on slide deposits than on other geological substrates. In summary, it would appear unwise to log lodgepole on any slide deposit or on any site on glacial drift or on a shale substrate having a steep gradient.

Table 12 compares vegetative stands with the soil association characteristic of the site.

It will be noted that the majority of lodgepole pine stands were on Loberg soils followed by by Garlet-Loberg and Garlet soils. Loberg soils are deep well drained clayey soils on hilly to mountainous glacial till uplands. Garlet soils are deep, well drained loamy and clayey soils on hilly to mountainous glacial till. Garlet soils are well drained loamy soils 20 to 60 inches deep over bedrock on hilly to mountainous landscapes. The remaining soil associations range from shallow to deep soils on very steep slopes to stony loam or stony clay soils. Thus 70% of lodgepole stands were on clayey to loamy soils on hilly or mountainous landscapes. The remainder of the stands were on coarser soil types.

Table 13 compares soil associations with surficial and bed-rock geology. It will be noted that landslide deposits occur most frequently on Loberg,

Table 12

Number of Vegetative Stands Occurring on
Various Soil Associations

Soil Association	Vegetative Type						
	Lodgepole Pine	Douglas Fir	White Bark Pine	Meadow	Sagebrush	Sagebrush	Willow
Loberg	76	11		14	2		
Garlet-Loberg	33	1		2			
Garlet	28	12	4	2			
Rambler	20		8	3			
Miscellaneous steep	20	23	12	2	3		
<u>Mountainous lands</u>							
Leavitt-Loberg	7			1	8		
Leavitt-Hanson	7	1			11		1
Teton-Garlet	4		2	1			
Bigel-Hobacker				5	37		6
Loberg-Hanson				3			

Table 13

Comparison of Soil Associations with Geology
Surficial and Bed Rock Geology

Soil Associations	Landslide Deposits	Undifferentiated Colorado&Montana Shale & Sandstone	Glacial Deposits	Undifferentiated Kootenai and Jurassic	Collu- vium	Coarse Stream Gravels	Glacial Meltwater Deposits	Madison Limestone	Undifferentiated Pennsylvanian Triassic	Rock Fall Pebbles	Stream Deposited Silt
Loberg	33	25	30		9	1	5			2	3
Garlet-Loberg	17	14	8	7	9						
Garlet	10	3	14		16						
Rambler	3	7	9	12	3	1	2				
Miscellaneous Steep Mountain Lands	8	21		18	1		4	7	8	4	
Leavitt-Loberg		5				1					
Leavitt-Hanson	3	4	10		1	4	2				
Teton-Garlot				6				2			
Bigel-Hobacker	5	3	1		3	15	4	1			
Loberg-Hanson											

Garlet-Loberg, and Garlet soil associations. Percentage wise, 76% of all landslide deposits were associated with these three soil types. Of the total lodgepole stands 75% were on these three associations and the greatest number of lodgepole stands (30%) occurred in landslide deposits.

One can therefore conclude that a definite hazard to any disturbance exists whenever lodgepole stands are present on hilly or mountainous terrain where the surficial or underlying bed rock is cretaceous shale and where Loberg, Garlet-Loberg, and Garlet soil associations are present.

The type of vegetational map prepared in this study can be very valuable for an agency such as the Forest Service.

The map can be used as an aid for setting up ecosystem classification for future management practices in this particular wilderness and adjacent forest areas.

It would be extremely valuable in determining if fire suppression will be necessary and to plan necessary steps in controlling or suppressing wild fires in areas of such high recreational value such as this one.

The map could be used as a tool for future recreational use management plans with particular emphasis on visitor use distribution in relationship to available meadow, forest, and barren rocky scenic areas.

During the summer of 1972 the Forest Service will photograph this area from the air. From examination of the resulting photographs, shades and patterns on the photographs can be correlated with vegetative types from the vegetative map thus providing a basis for their photo-interpretation. This will be related to mapping and their future management plans for the area.

A total of 68 sites were selected on the trail to Ulrey's Lake and

the North Fork trail to the Spanish Peaks Primitive Area. These trails can be expected to receive much heavier use as the Big Sky development grows. Ulrey's Lake will be readily accessible from the Mountain Village and the North Fork trail originates at the Big Sky's Lone Mountain Guest Ranch.

At each site a series of 0.1 m^2 quadrats were laid out at the center of the trail at both edges and at intervals of 1/2, 1, 2, and 4 meters from both sides of the trail edge. The percentage cover and frequency of herbaceous understory was measured, a list of plant species found on the site was recorded and the depth and width of trail wear was recorded. Each site was photographed from two angles and the basal area of timber overstory was measured.

A list of species that increased, decreased or showed no change was prepared based on the change of percentage cover and frequency of herbaceous vegetation along the gradient of quadrats leading away from the trail.

Two species were found to increase with trail usage in all three timber types namely: Hieracium gracile and Erythronium grandiflorum. Invariably Vaccinium scoparium decreased with trail use.

Each of the three timber cover types were characterized by different species of increasers and decreasers (Table 14).

The study provides a method of monitoring by plant indicators the present condition of the trail and associated flora for comparison with future trends.

The identification of increasers and decreasers provides a means of predicting vegetational trends along wilderness trails with change in usage.

It also provides a method of sampling for plant invaders resulting from the practice of hauling hay into wilderness areas for pack animals.

Some undesirable plant species (Cirsium arvense and Cardus nutans) are coming into the meadows now from this practice.

Both the Forest Service and National Park Service are concerned with the effects of trampling associated with trail use.

Table 14

Important Increaseers and Decreasers Associated
With Overstory Canopy

	<u>Canopy Type</u>		
	<u>Lodgepole Pine</u> (<u>Pinus contorta</u>)	<u>Alpine Fir</u> (<u>Abies lasiocarpa</u>)	<u>White Bark Pine</u> (<u>Pinus albicaulis</u>)
Increaseers	<u>Poa pratensis</u>	<u>Epilobium alpinum</u>	<u>Sibbaldia procumbens</u>
	<u>Arnica latifolia</u>	<u>Poa pratensis</u>	<u>Carex podocarpa</u>
	<u>Geranium visco-</u> <u>sissimum</u>		<u>Lupinus sericeus</u>
			<u>Arnica latifolia</u>
			<u>Erigeron peregrinus</u>
Decreasers	<u>Thalictrum venu-</u> <u>losum</u>	<u>Arnica cordifolia</u>	<u>Phyllodoce empetrifomis</u>
	<u>Vaccinium mem-</u> <u>branaccum</u>	<u>Thalictrum venu-</u> <u>losum</u>	<u>Abies lasiocarpa</u>
	<u>Viola nutallii</u>	<u>Aquilegia flav-</u> <u>escens</u>	
	<u>Pyrola secunda</u>	<u>Pyrola secunda</u>	
	<u>Epilobium angust-</u> <u>ifolium</u>		
	<u>Abies lasiocarpa</u>		

The economics team is operating with a model that begins with expected flows of people into Gallatin County as a result of the construction of the Big Sky of Montana project. From there we go to activities of these people, and from activities to increased expenditures resulting. The expenditures will include not only the expenditures of the users of the recreational facilities but also the investment expenditures of Big Sky in anticipation that the users will come. We will not stop with original expenditures. In one way or another we must apply multipliers to the various types of expenditures.

But expenditures alone have little meaning to most people. The following is a list of "results" from which the team expects to draw some important analyses and conclusions:

- 1) Induced business activity (other than Big Sky) -- changes in the business climate,
- 2) Flows of income (application of multipliers);
- 3) Resulting increased employment;
- 4) New capital investments;
- 5) Increased tax base, need for public services;
- 6) Changes in land ownership, land use, and land prices;
- 7) Alternative use of resources, eg. skiing as compared with a small cattle feed base and timber harvest (or vs. types of recreation that exclude all but a few people); and
- 8) Necessary investments for environmental protection.

In addition, the economics portion of the interdisciplinary study will generate a fair amount of data, eg. volume and characteristics of vehicular

traffic, that is not of particular interest in itself. However, such data is vital as input for other portions of the large study.

Study by the economics team is divided into three interrelated sub-topics: Travel Study (Dr. Donald K. Rose); Impact on Business Activity (Dr. Dana H. Myrick); and Land Ownership, Land Use and Land Prices (Dr. Layton S. Thompson).

TRAVEL STUDY

1. Description and Summary of Progress, 1971-72

Due to the nature of the data generated, the travel study forms the core both for the large study and the smaller economics study. During the past fiscal year, the emphasis of the travel study has been less on the gathering of data (although there was some of this) and more on

1) Conceptualizing the management of the data with the objectives of

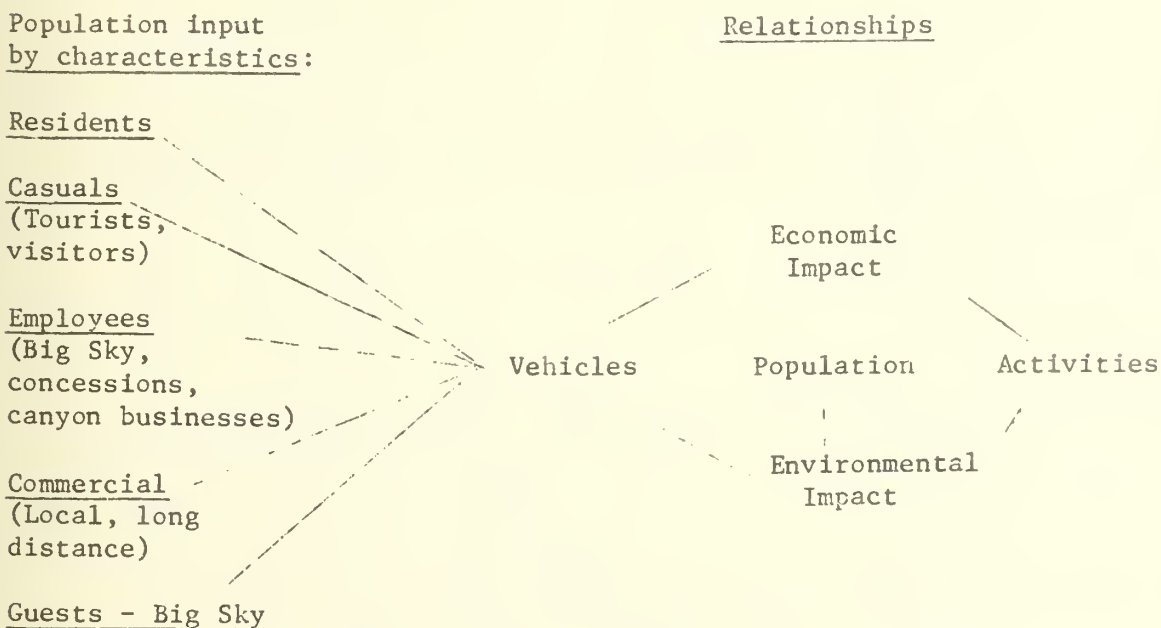
- a) Determining the present and estimated future economic impact of vehicular traffic moving into and through the Gallatin Canyon and
- b) Providing reasonable estimates of vehicle counts (by type), passengers (by characteristics), and activities of people within the Canyon. These estimates are critical to the researchers associated with different aspects of the Gallatin Canyon Study if they are going to be able to estimate, in turn, the impact on the environment of the present and estimated future flow of vehicles, vehicle occupants and activities.

2) Gaining a comprehension of the nature of, and problems within, the studies of the Canyon being conducted by the other scientists.

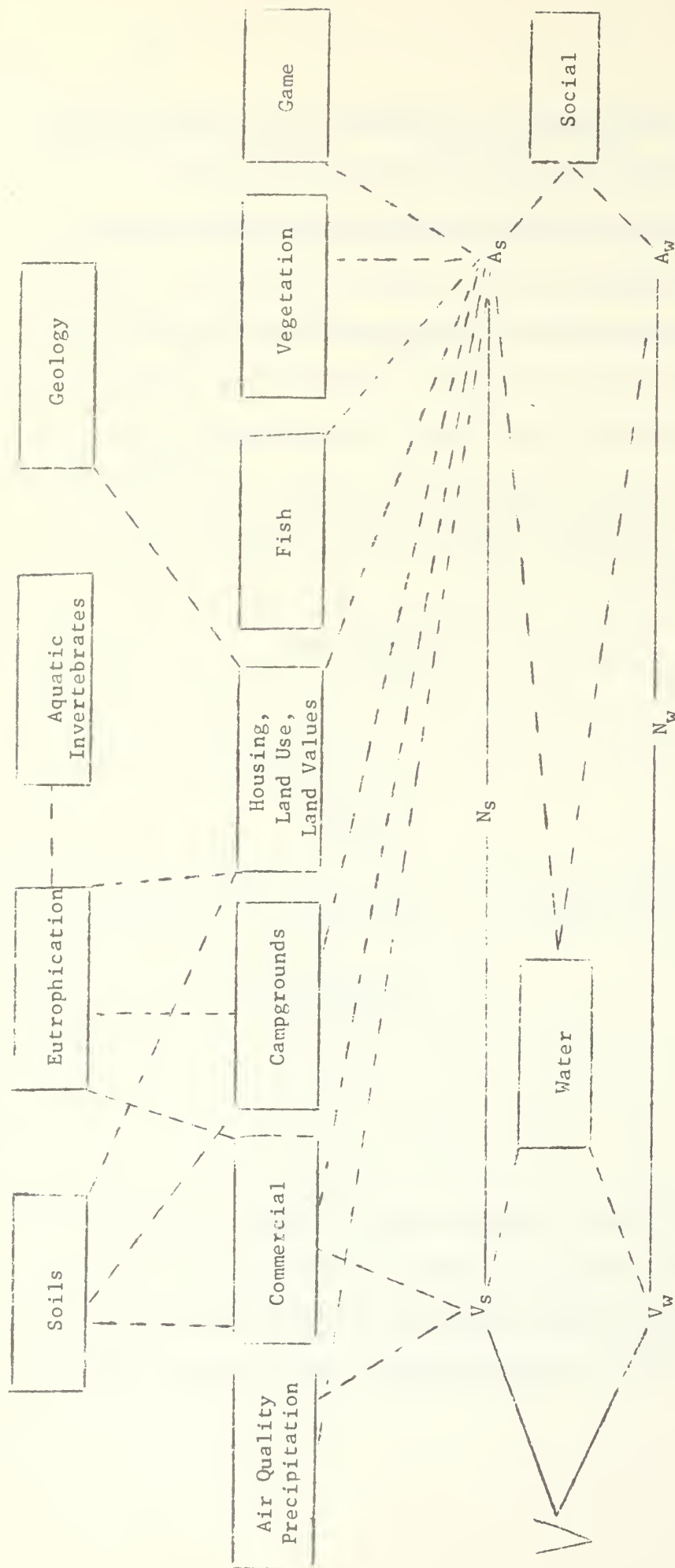
3) Learning to relate the travel study to the natural and other social science studies underway.

4) Reaching agreement with the natural and social scientists that the focal variable for the Canyon is the human population and its activities.

Much of the effort has been directed toward the development of models which allow researchers to analyze large amounts of data by means of a simplified, structured view of reality. Schematically, the Gallatin Canyon analysis is seen as follows:



At the present time, access to the Canyon is, with minor exceptions, restricted to the highways. Vehicles (V) bring a diverse population (N) into the Canyon; this population will pursue various activities (A), which we have identified and for which we have estimates. These vehicles, pop-



Vehicle estimates are disaggregated as to seasons (in this example we show V_s (summer) and V_w (winter) on the hypothesis that the characteristics of the population (N) vary according to season.

Relationships shown for summer populations would also apply to winter populations.

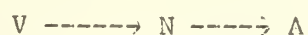
Population (N) is disaggregated by activity (A) on the assumption that it is the activity pursued, rather than numbers per se which matters. Hence, the environmental impact flows from A rather than N.

ulation and associated activities have an economic and an environmental impact. In order to estimate the impact, these inputs must be evaluated by the natural and social sciences for resultant changes. The findings, hypotheses, and estimates will then be summarized for use by the public and by decision-makers for policy determination. Additionally, the "feed-back" will be analyzed to determine what economic and environmental changes may affect the willingness of the population to continue to come to the Canyon and to pursue various activities.

The travel study collects data of three, broadly defined, classes:

1. Numbers and types of vehicles, symbolized as V;
2. Numbers and characteristics of vehicle occupants, symbolized as N;
3. Activities of vehicle occupants, symbolized as A.

Schematically, the basic relationship can be symbolized as:

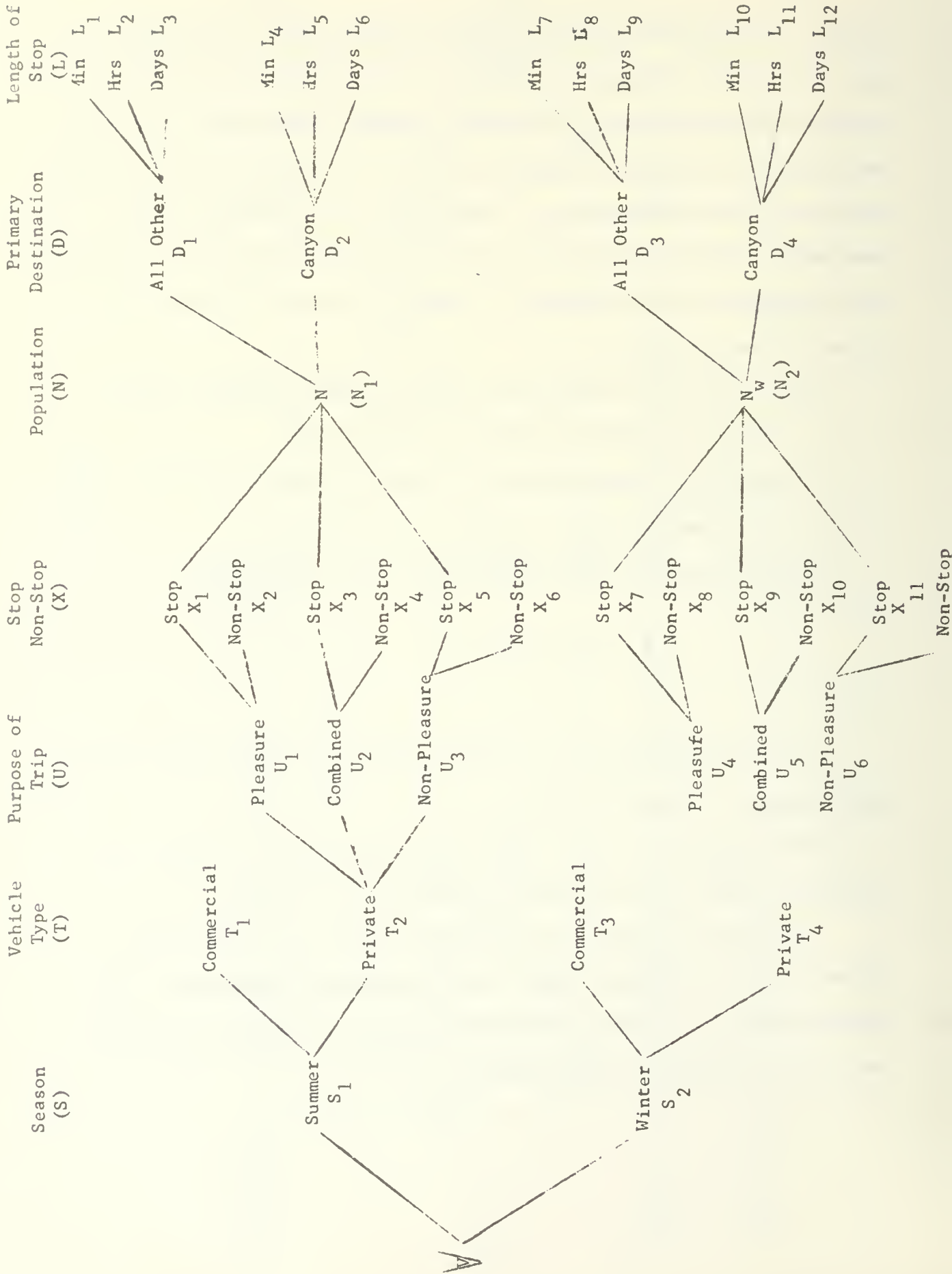


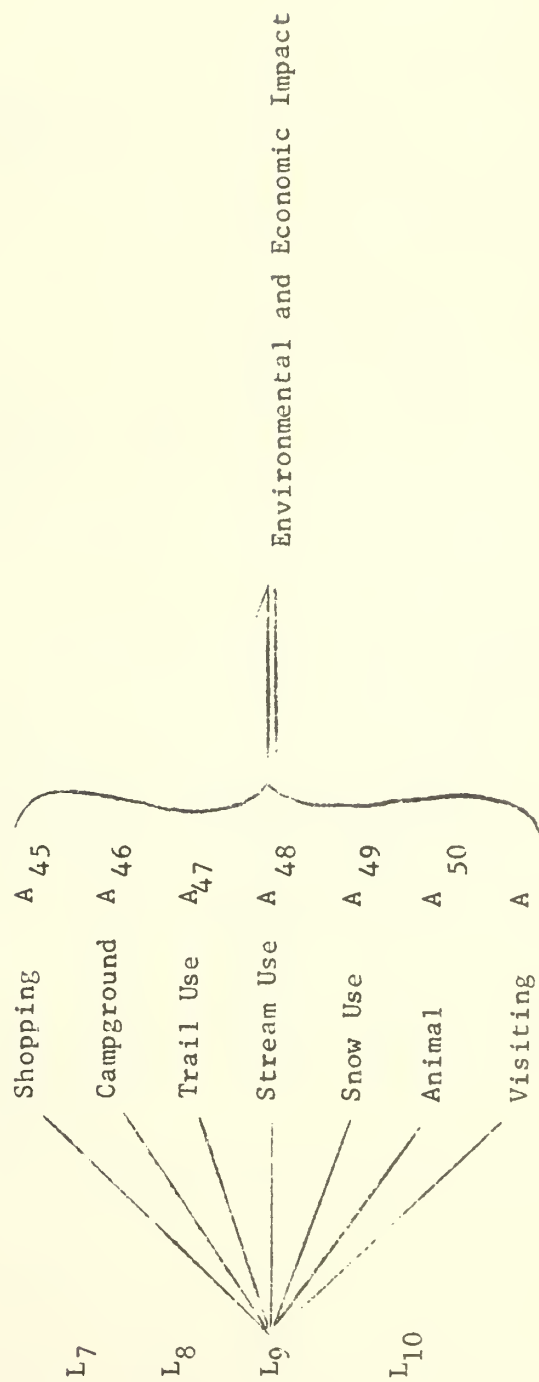
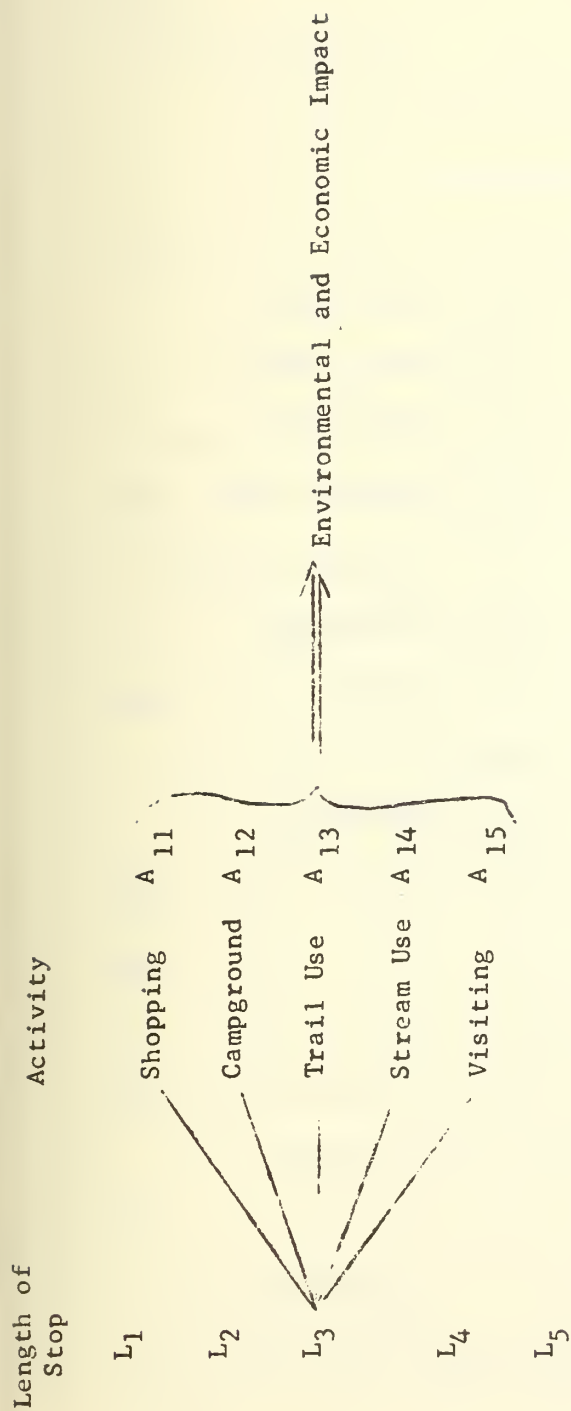
The relationship between the three classes of traveller data and the other studies is seen as follows .

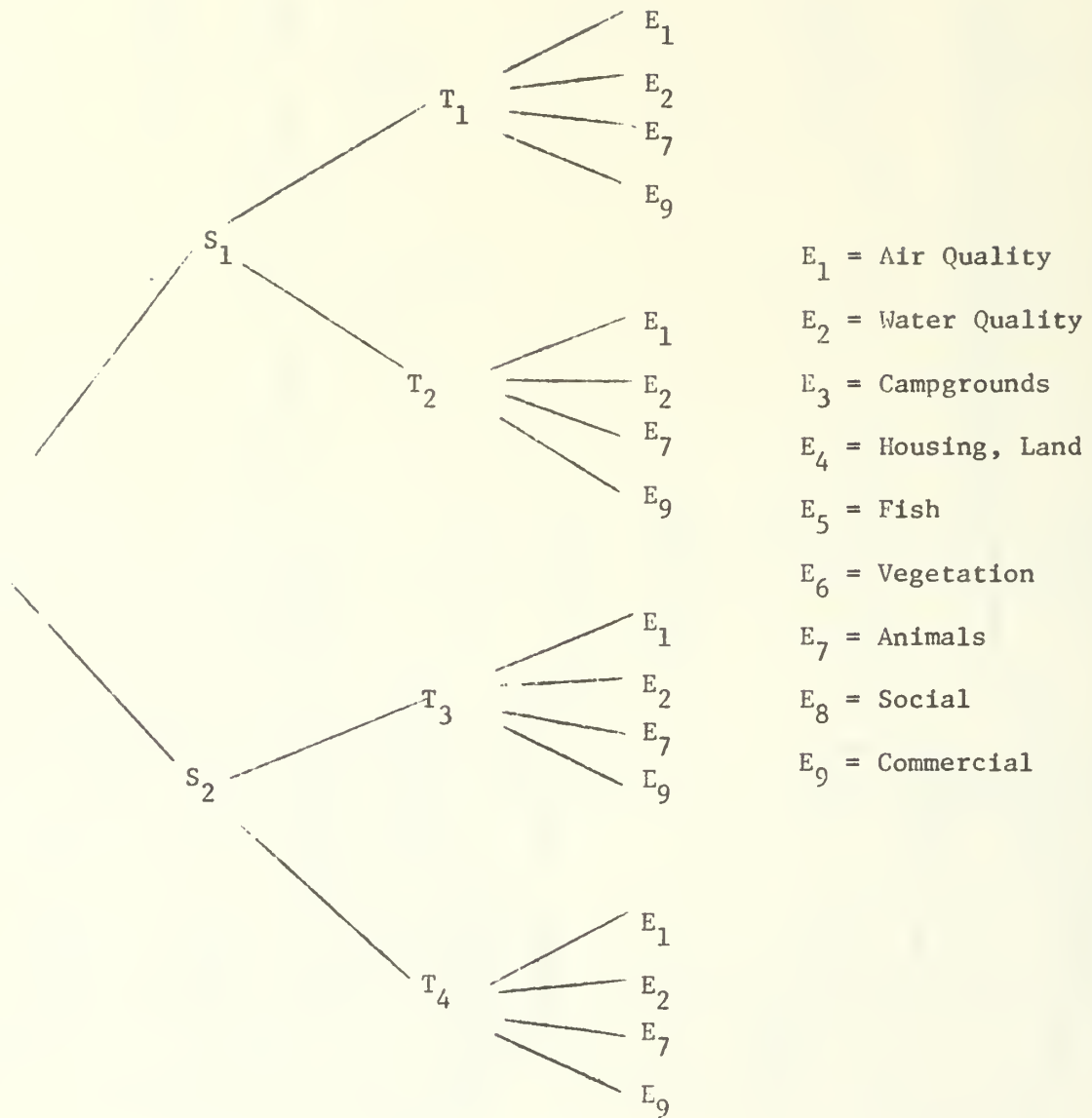
The disaggregation model, which leads from the vehicle input to the activities pursued by the resultant population is as follows.

In addition to the potential impact of human activities in the Canyon there is a potential impact due to the vehicles themselves. This impact arises not only from the numbers, but also the types of vehicles and can be represented schematically as:

7







Vehicle Impact

Using the models described above, researchers will not only be able to analyze the existing travel situation, but should be able to make predictions concerning the numbers and characteristics of vehicles in the future.

2. Data Collected

The following data has been collected during the past year:

1) Traffic was sampled during June, 1971 to add to the samples taken during July, August and September of the preceding year.

2) Hunters were interviewed at the Game Checking Station this fall.

3) The installation, by the Highway Department, State of Montana, of a traffic counter in the Canyon has begun (as of February 1, 1972) to provide hourly traffic counts on a year-round basis.

3. Reports Issued

In addition to collecting new data, a number of summary reports have been issued:

1) Summary of the June, 1971 traffic sample; issued December, 1971.

2) Summary report of snowmobile travel in and around West Yellowstone area: Data collected January and February, 1971; reported issued October, 1971.

3) "A Proposed Data Management System for the Travel Study Portion of the Gallatin Canyon Study"; issued January, 1972.

4) Summary report of the Summer, 1970 traveller survey; issued March, 1971.

4. Work in Progress

At the present time, there are a number of "sub-projects" in progress:

1) A combining of the June, 1971 traveller survey results and the July, August, September, 1970 travel survey results. Differences and uniformities to be pointed out in the summary report.

2) Data management system is being mounted on the computer.

3) Results of the hunter survey are being fed into the computer. A report will be issued on the results as soon as they become available.

4) Negotiations are underway with the Highway department to obtain a traffic counter in the West Fork of the Gallatin Canyon.

5) Plans are being formulated for a traffic sample to be conducted in April-May, 1972.

5. Plans for Future Work

Plans for work to be accomplished in fiscal year 1972-73 include the following:

1) Begin operating the data management system on the computer. Feed in actual and hypothesized estimated data; examine results.

2) Sample traffic in early July, 1972, and sporadically in August, September, and October, 1972.

3) In cooperation with the U.S. Forest Service, begin a trail-bike survey during the summer months, 1972.

4) Meld the results of the samples obtained by Dr. Richard Graham (Fish Research), Dr. Harold Picton (Elk Research), Dr. Eugene Sharp (Air Quality Research), and Mrs. Anne Williams (sociologist), to the results of the three economic surveys (travel, land use and value, and business).

6. Public Interest

Three government bureaus have expressed an interest in the results of the travel survey:

1) Planning and Research Bureau of the Montana Highway Commission: Interested in using the information to determine guidelines for economic studies to evaluate economic growth center performance.

2) U.S. Forest Service: Interested in travel volume and projections characteristic of campers using National Forest land.

3) Fish & Game Department: Interested in results as they come along to supplement their information on fishing and hunting activities and point out relationships they have not thought out themselves.

IMPACT ON BUSINESS ACTIVITY

1. Description and Summary of Progress, 1971-72

As mentioned before, the vehicles, population and their activities have two types of impact on the Canyon and its surrounding area: environmental and economic. The study of the business aspects of the economic impact is the domain of Dr. Dana Myrick. There was a shift in emphasis between the first two years of this study, from a base-line study and analysis to a predictive model, to estimate the impact of the Big Sky Development upon business. Data was collected for a base-line study during the first year and this data will still serve to estimate coefficients related to activities at Big Sky and the numbers of people involved.

The most solid sources of data are in terms of the following factors:

- 1) Big Sky investment contracts;
- 2) Expected numbers, kinds, and behavior of people:
 - a) How they are expected to come,
 - b) What they are expected to do
 - c) How much they are expected to spend on what;

- 3) Expected construction of private homes;
- 4) Investment in utilities and transportation;
- 5) Concessionaires (types of business and employment).

In order to present a reasonable solution, the impact of Big Sky must first be defined: Big Sky is an autonomous change in the economy of the area; it has a continuing impact of some kind on business: in the Canyon, in Bozeman, in the total Gallatin area, in Gallatin County, and other parts of Montana.

The specific objective then, is to develop a predictive system to estimate these impacts on business, which can be transported for use in other similar situations, and which will reveal the variables and their inter-relation.

The sources of the economic impact can be summarily described as:

1) The direct impact of the Big Sky development both in terms of the corporation's initial investment and the continuing investment made by the corporation and private individuals at Big Sky.

2) The indirect impact from the Big Sky Development:

- a) Land boom;
- b) Increase in Canyon business both for old and new businesses;
- c) Increases in Bozeman, Gallatin County, and other Montana business;
- d) Impact on social facilities and services that will affect businesses through changes in public costs and tax base.

A development such as Big Sky has two basic sources of impact: people and investment. The people would not be coming to Big Sky if it were not for the investment, and the investment would not be made in Big Sky if the

people were not expected to come there. These two impact sources provide the initial demand for goods and services, and also supply us with our most reliable data. Since there is good information available on the people that are expected, it was decided to use people as the beginning point of reference.

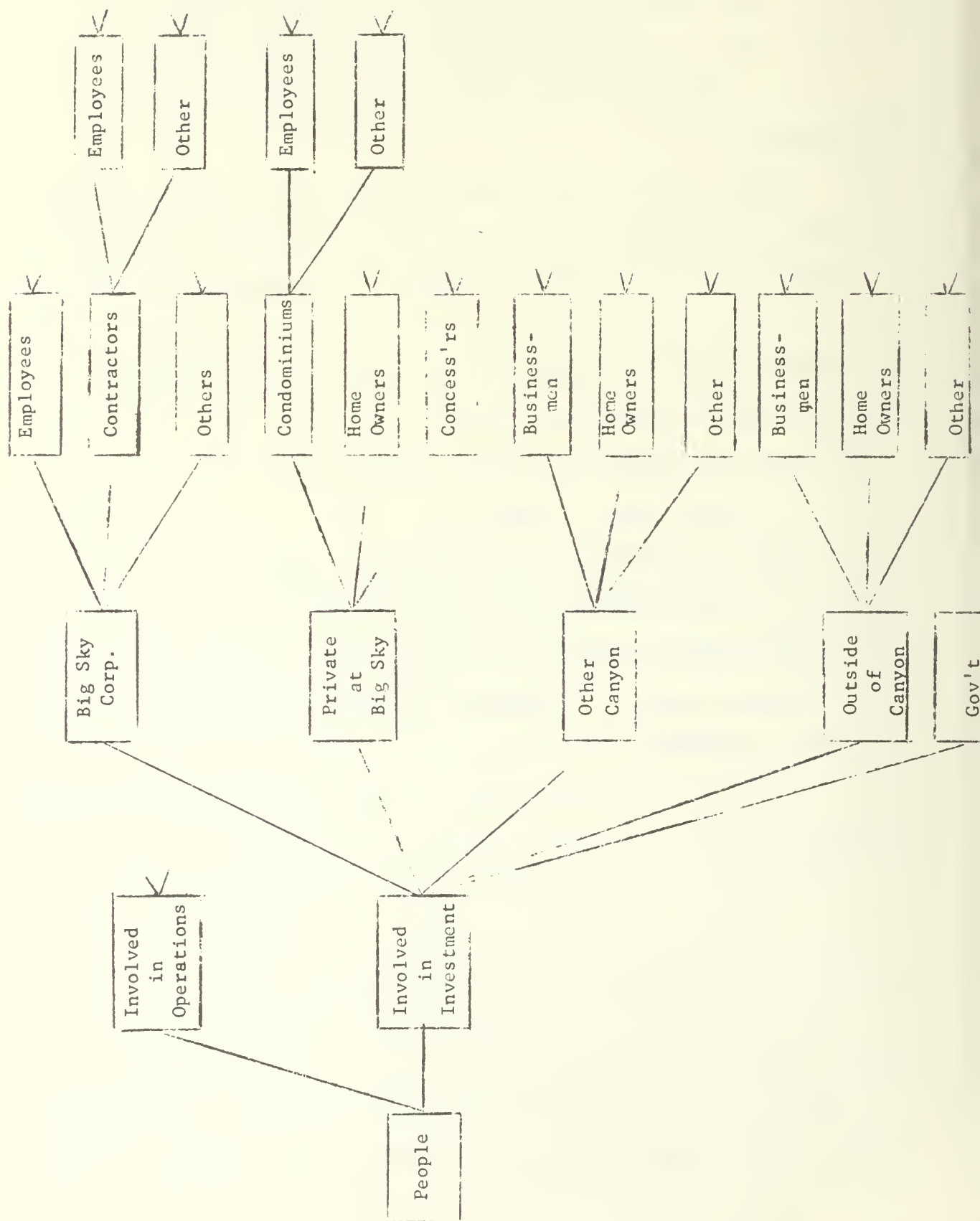
Several types of predictive models have been explored, including the typical input-output, the partial budget (which demonstrated the variables involved), and a disaggregative system. The disaggregation system appeared to be the best adapted to the kind of data with which we have to work. Beginning with people and investment we are able to diagram a system into which we can fit data and estimates to show:

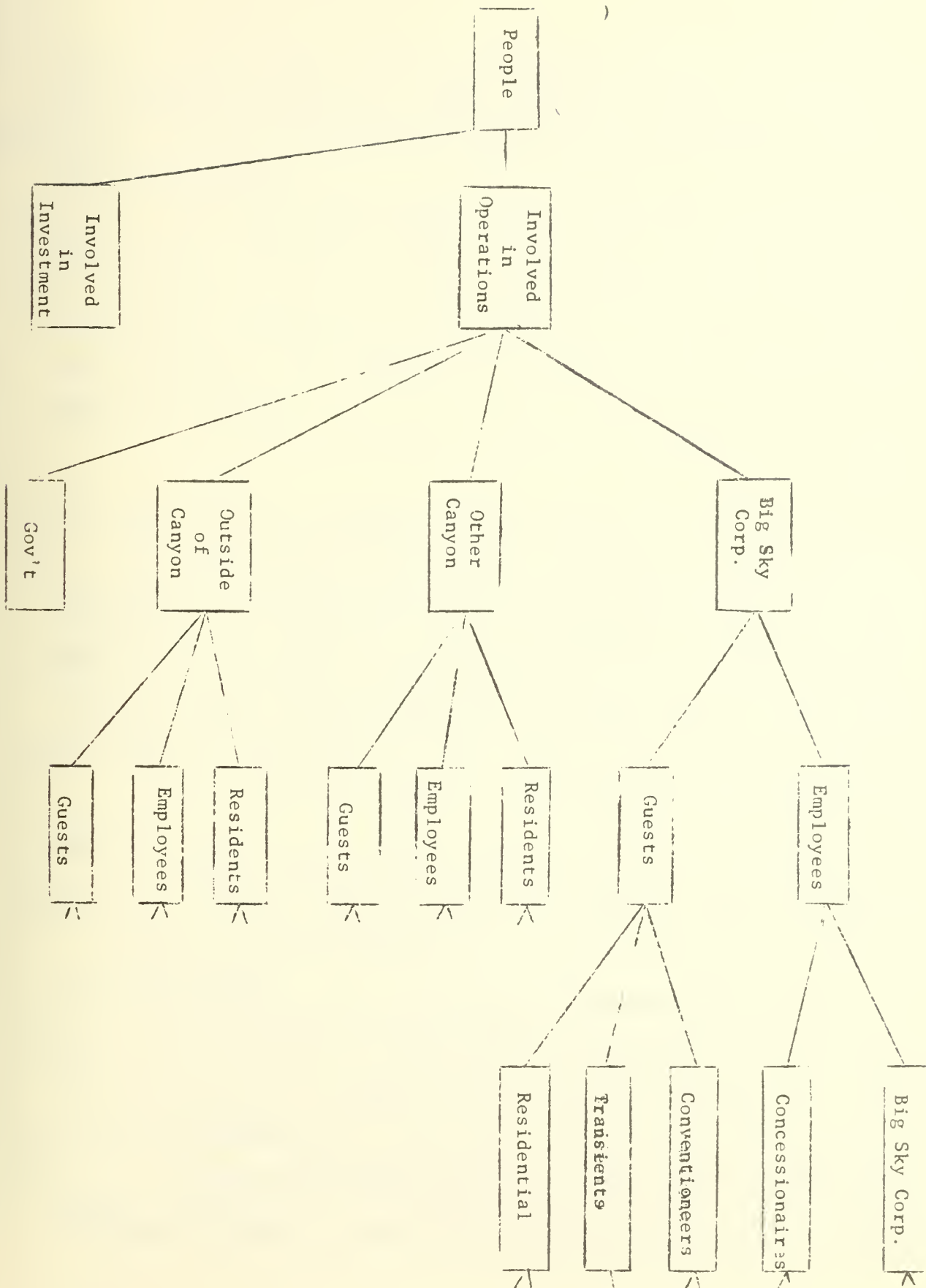
- 1) Total impacts on income to business;
- 2) Total impacts on employment;
- 3) Total impacts on business "climate", and
- 4) Total impacts on business development.

The variables involved in the study of the impact can be isolated, and it should be possible to determine the coefficients necessary to apply to these variables.

The basic disaggregation model is shown in the figures that follow.

I. Basic Disaggregation of Economic Impact of Big Sky Development: People Affected by Big Sky Operations





In developing the model, it became evident that combining investment activities with operational activities would create problems because of the differing nature of the two and the period involved; ie. operations evolve into continuous activities while investments are made at one time, even though the impacts from such investments can continue for a long time afterwards. On the cost side, the cost of operations would be the annual cost involved in those operations, while all the costs of investment are charged off in depreciation and interest. The separate impacts can be combined in the final analysis.

Once the distinction is made between operational and investment activities, the remaining disaggregation becomes clear from the flow-chart of the model. In using the disaggregation model, the researcher must examine the various categories of people and the activities in which those people will be involved. Such information will be adapted from the traffic study to provide a good picture of the Canyon impact of more people entering the area in different modes of travel.

Beyond this, it will be necessary to attach dollar values to different categories of people. These dollar values will add, through the application of economic multipliers, to the solution of the final impact problem.

Apart from the development of the model, the most important progress during the year was being able to put together a workable interdisciplinary effort. This was done through the regular meeting of the business-impact task force, which included water, biological, and meteorological scientists, and an economist. The result was a much broader understanding of the implications of the various disciplines in determining the business impact of

the Big Sky development. Data from these other disciplines supply the ecological impacts and constraints that will affect the economic impacts.

2. Data Collected

1) The base-line data collected last year and early this year will serve as a basis for estimates. Data was collected on bank debits and deposits, vehicle registration, telephone hookups, power hookups, various service-type businesses such as restaurants, motels and hotels, and professional and other services.

2) Current data and future estimates on investments in the Big Sky Development have been obtained from the Big Sky Corporation.

3) From the expected occupancies of Big Sky for different seasons, we have estimated the person-day uses of Big Sky as the basis for estimating economic and other impacts (including environmental.) The general traffic impact in the area was also estimated from these data. These estimates are subject to correction as further data is collected.

4) Data from various sources on people expenditures at this type of development are being collected.

5) A study of the estimated impact on airlines and the local airport facilities is about 75% complete.

3. Reports Issued

No final reports have been published or presented. However, papers have been presented to the seminars of the total research team.

4. Work in Progress

1) Complete the study of the impact on the airlines and the local airport facilities.

2) Continue collection of data to fill in the predictive model:

- a) Refining estimates of the people expected at Big Sky, including the guests of the Big Sky operation itself, and additional people coming into the community due to the Big Sky development;
- b) Estimates of business development adjacent to the Big Sky area;
- c) Estimate of business growth in the community from increased population due to Big Sky;
- d) Search for coefficients of people's expenditures and travel activities in the area;
- e) Environmental limitations on growth.

3) Continued work with other disciplines under the general plan of interdisciplinary seminars and exchange of data and ideas.

5. Plans for Future Work

1) Completion of business impact model, developing and using data and estimates.

2) Generalize the model and work with other disciplines to integrate the total impact model.

3) Summarize and evaluate the use of the model in similar situations.

4) Extend the study to evaluate impacts on adjacent areas, particularly Madison County and West Yellowstone, as time and the budget permit.

Also, under this extension of the study, the total state would be considered.

LAND OWNERSHIP, LAND USE, AND LAND VALUE

1. Description and Summary of Progress, 1971-72

One of the immediate effects of any large development such as Big Sky is that felt as land prices begin to change. Undoubtedly, much of the

activity in the land market was present before most of us heard of the Big Sky Development. However, those who conceived of and planned the project were likely aware, at least to some extent, of what was going on in the land market. They were influenced by it, on the one hand, and their activities constitute a part of the stepped up pace of land transactions.

Accordingly, if we are to measure all impacts of Big Sky, we must evaluate changes in land ownership, use, and prices which occurred because of it. To do this, changes in land ownership and land use in the Gallatin Canyon and in the remainder of Gallatin County must be recorded and analyzed. This will serve as a basis for isolating the effects of the Big Sky project on the land ownership and land use patterns in the county. A continuous record of land prices must be kept, to serve as a basis for determining the degree and timing of the changes in land prices, and to estimate the effects of increased land values and land improvements on the tax base of the County. In addition, it is desirable to analyze possible alternative use of resources; eg. skiing as compared with a small cattle feed base and timber harvest.

Most of the information is being, and will be, obtained by monitoring transfer data at the Gallatin County Court House and by interviewing buyers and sellers either personally or by mail to get sales prices. A running account of land prices can then be compiled, and the change in ownership and use patterns will be available at the end of the study period.

Changes in land prices are a phenomenon, the timing of which is distinctly different from most of the other variables under study. Because land prices tend to increase in anticipation of changes in land use, the effects

of the Big Sky Development on land prices may well peak out in 1970 or 1971 rather than after most of the facilities of the project are in operation. In order to examine this, a yearly index of land prices from 1965 to 1973 will be obtained, particularly on land suitable for housing developments and business enterprises. In addition, the assessed valuation of the Gallatin Canyon area (either actual or potential) will be compared for the years 1970 and 1973.

Land use and land use patterns are determined by a large number of variables. It is, therefore, necessary to develop a method for organizing the raw information into a system which will produce data on the variables in which we are interested. A multiple regression approach will be applied, using such variables as distance from town, presence or absence of stream frontage, presence or absence of timber, distance to National Forest boundary, view, soil type. The information thus generated will allow researchers to analyze land use patterns, including alternative uses.

2. Data Collected

To date, the following information has been compiled:

1) Some data has been obtained for property tax assessments in the Canyon for fiscal years 1968, 69, 70 and 71. Some preliminary estimates indicate that Big Sky, Inc. would add over \$100 million of taxable value in Gallatin and Madison Counties should the Master Plan be completed by (say) 1985. Additional valuation will result from induced activity.

2) For the period 1965 to 1970, we now have 500 sales for which we have verification of sales price and verification that they are bonafide "arms length" market transactions. Of the original 500 which have been verified:

95 sales represent tracts south the mouth of Gallatin Canyon;
75 sales were of tracts 40 acres or more, which have been
arbitrarily classified as farms or ranches;
425 sales were of tracts of less than 40 acres, less than
one-half of which are in officially approved and
platted subdivisions and more than one-half of which are
individual, more or less isolated, tracts.

3. Reports Issued

No final reports have been published or issued. However, a number of papers have been presented to various Resource Economics committees, which have expressed interest in work being done. In addition, papers have been presented to members of the study team at two interdisciplinary seminars.

4. Work in Progress

At the present time, envelopes are being addressed to send to 500 buyers of tracts of land during 1971. All together we expect to have a sample of 750 sales.

5. Plans for Future Work

Plans for work to be accomplished in the coming year include:

- 1) The tax data which has been obtained will be refined.
 - a) Projections will be made of increased requirements for public services (schools, highway changes, health facilities, police protection, general governmental services, etc.)
 - b) Projections will also be made of increased revenue collections from property taxes, income taxes, gasoline taxes, cigarette taxes, liquor taxes and licenses as a direct result of the development of the Big Sky rec-

reaction complex as well as induced activities.

2) A multiple regression analysis will be made of the sales-price data being collected, with the most interesting variables likely to be year of sale, size of tract, stream or lake frontage, road mileage to Bozeman, distance to National Forest boundary, soil type (related to Leason-Nielson classification), distance to all-weather roads, and amount of development (approved subdivisions). The data cards should be punched by the end of spring quarter, 1972.

3) All the data will be integrated with the traffic data and expenditure data resulting from the flows of people as mentioned at the beginning of this report.

6. Public Interest

There has been a great deal of interest expressed in the results of this land use study. Following is a list of groups which have received and/or will receive information on these results:

- 1) Great Plains Resource Economics Committee;
- 2) Interregional Resource Economics Committee;
- 3) Western Resource Economics Committee;
- 4) Great Plains Regional Resource Project, "Adapting Institutional Patterns for Viable Rural Communities";
- 5) State Board of Equalization; and
- 6) About 200 requests from those who answered the questionnaire for a copy of the sales price study report.

SOCIETAL RELEVANCE

There are at least two broad problems facing our society in providing

for leisure time activities: one is providing sufficient facilities and areas appropriate to the pursuits of the populace; and the other is preserving the characteristics of the areas which made them a desirable place for leisure expenditure in the first place.

Additionally, Montanans have some particular concerns. A vigorous and healthy economic environment is necessary for the welfare of Montana's citizens. Montanans are vitally interested in how and for whom the State's natural resources are exploited, and the external costs incident to the use of these resources. The introduction of additional recreational facilities into the Canyon area, the continual increase in travel activity, and the continued growth in the nation's population and shrinkage in available natural areas point toward significant changes occurring in the characteristics of travelers through the Canyon and a rising pressure on the present population and environment.

Montanans generally recognize the economic opportunities of recreational activities. We are less sure of our abilities to determine the acceptable rates of recreational resource use. It is a reasonable hypothesis that today's volume and character of travelers throughout the Gallatin Canyon are not all that the area can tolerate and still preserve its attractiveness. Measured changes in traffic volume and character coupled with the social and environmental changes detected by the natural scientists should rather promptly alert Montanans to the current and prospective externalities to recreational development. Thus the studies will permit a better informed populace to make the necessary political choices determining Montana's future.

Nationally, it is not unreasonable to suppose that some significant decisions relative to the private use of public recreational areas are in the offing.

We have already seen various state and federal agencies reacting to the recreational resource problem by restricting the private use of public lands and, on the other hand, qualifying private property rights to provide the public access to recreational resources. If we are to have rational policy decisions as to the optimum development of these resources, then studies such as this one are important to the planning and development process.

The concepts of planning and development have been raised to the levels of highest esteem in our society, almost without regard to the problem at hand. A remarkable amount of effort is expended in the names of these concepts. The Big Sky recreation project is planned, internally and in conjunction with almost all interested parties. Out of this effort will come a specific result. But unless and until we learn more about the results of planning, we cannot be sure that this process leads to a higher optimal use of resources than a less structured development. To gain an insight into this fundamental question is also a part of the study.

One of the principle purposes of the Gallatin Canyon study is to examine the productivity and utility of inter-disciplinary research focusing on environmental and ecological problems. From the Project inception members of several disciplines were involved in formulating the proposal and designing the dimensions of the total project.

As we proceeded it became quite clear that successful inter-disciplinary activity required extensive time commitments of the chief investigators, and substantial involvement of other team members, simple to understand and appreciate the potential contributions of the various disciplines; for many

members of the group "communication" and "coordination" required substantially more time than the work on their sub-projects.

To facilitate effective inter-disciplinary understanding and integration a series of seminars were initiated early in the project, to acquaint team members with each other and with the concepts and variables under study in each substantive area. The climax of this activity was a two day workshop involving all principle investigators and a team of five invited consultants from other universities, one of whom served as workshop leader. The workshop resulted in significant re-organization of the project, to further facilitate effective team effort. An evaluative review of the two day session indicated substantial satisfaction with the experience and a major incremental increase in interpersonal and inter-disciplinary understanding.

The workshop was followed by a further series of weekly seminars offered by groups of investigators, to clarify research approaches, offer attempts at integration for critique by the group, report on substantive findings and to clarify inter-relationships among variables.

As a means of securing systematic feedback from investigators, a questionnaire was circulated requesting detailed information on (1) the basis for involvement in the project (2) reactions to the experience since the inception of the project and (3) suggestions for improved approaches. Most of the active investigators responded (27) but no feedback was received from several former participants who had either left the campus or completed their sub-project. Thirty-four individuals have been involved in some phase of the research, representing fifteen departments. Respondents to the questionnaire include:

Five Social Scientists
Four Earth and Air or Climate Disciplines
Four Engineers or Architects
Eleven Biological Scientists
Three Economists

The results of the feedback from the questionnaire are summarized below; Appendix III contains the original questionnaire with marginal totals and comments by individuals.

Summary of results

1. The bulk of the 27 responding investigators submitted sub-project proposals simply because they wanted to be involved (9) or felt their disciplinary background was necessary to the study (11). A few were urged to participate by the department heads or other staff members, although their personal preference would have been to concentrate on other work (10 responses. Note; several individuals listed more than one basis for participation).

2. Prior to involvement in this study 16 of the 27 investigators were engaged primarily in discipline oriented research. This project was the first inter-disciplinary involvement for 12 people. Five of the group felt that inter-disciplinary research was less important as a professional activity than study strictly oriented to a single discipline. Roughly one-half of the participants foresee little significant professional advancement as a result of involvement in this project. Eight were substantially disturbed by the potential lack of reward.

3. The personal effort required to coordinate with other investigators was considered a burden by 12 team members, but no one was sufficiently frustrated by requirements of inter-disciplinary coordination to forego involvement for that reason alone. Twenty-one of the twenty-seven indicated

they would again become involved with the Gallatin study if they were "starting over".

4. The majority of the group (15) preferred to have an independent sub-project budget over which they had personal control. However, an equal number would have participated even without such control; only six would have failed to participate without budget independence.

5. Nine of the group were "pro" Big Sky when the project was initiated, while five were "con"; the remainder were largely neutral. Thirteen felt they had a complete and accurate perspective of Big Sky plans and intentions at the initiation of the project; eleven felt their perspective was at least somewhat distorted.

6. Many of the investigators made specific suggestions for improved project organization, although satisfaction with present structures was generally positive:

- a. Have a small inter-disciplinary group define the major research problem; then search carefully for people who can effectively contribute to the objectives defined.
- b. Obtain greater relief from other time commitments for investigators, and budget funds to compensate departments for released time.
- c. A project like this needs "strong" management direction. More power and greater leadership needs to be exhibited by the chief investigator, (or investigators). Roles and responsibilities for management need greater clarification and funds should be allocated to support required management time.
- d. Limit the study to a smaller number of projects organized

around major sub-areas of investigation.

e. More effort is needed to develop coordination and integration immediately after initiation of the project. This would have speeded up the effectiveness of the project.

f. Clarification of the time requirements for inter-disciplinary research is needed prior to involvement of investigators, so that decisions about involvement can be made on a more rational basis. Most team members used much more time on the project than was originally allocated.

g. The structure of the project should allow for more systematic and continuing evaluation of applications to national needs; we need greater focus on "societal relevance"

h. A novel project like this needs to budget funds to study the "process of inter-disciplinary research", so as to develop a more adequate model. This was not emphasized in early stages of the project.

i. The university needs to develop the capability to mount short-term task force efforts of this kind, or we should not attempt this kind of effort. Problems of personnel assignment inflexibility, physical dispersion and professional and discipline loyalties must be overcome, or this type of activity may not be the university's "cup of tea".

j. We need well-rounded, highly qualified environmental scientists to administer and coordinate this type of project. Professional conscience needs to guide the design and conduct of such research, rather than "financial survival", unreserved cooperation of all

investigators is required.

k. There will be a severe problem in writing a composite and integrated report. Careful attention and planning should be given to this process immediately.

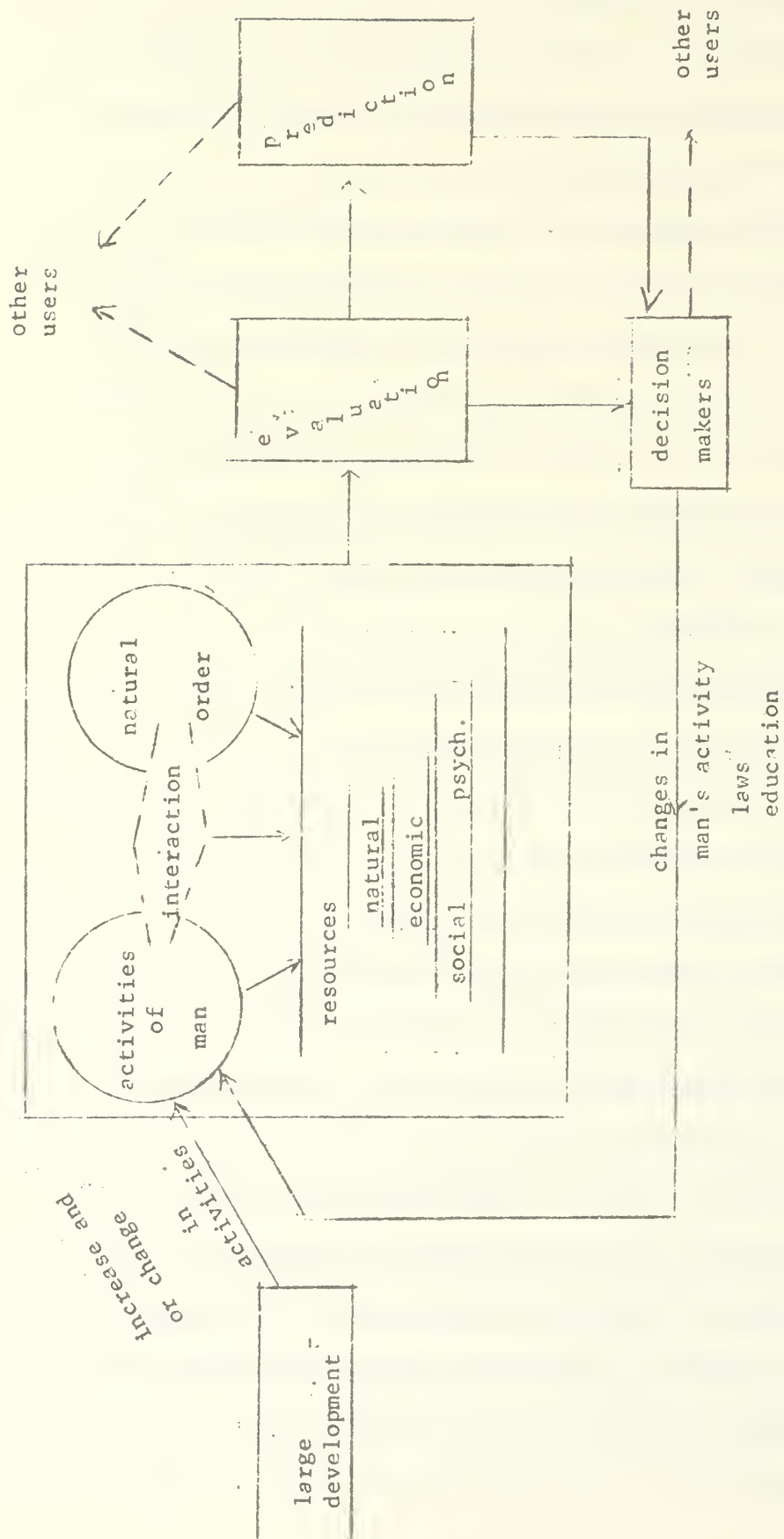
In summary, there appears to be a high degree of commitment to the project among the investigators. The great majority appear to feel the effort is worthwhile, regardless of the serious problems encountered.

There is a clear concern about the inadequacy of the institutional structure for facilitating this type of research, and a high level of uncertainty about the professional and financial "rewards" that will result from involvement. High interest in developing a more adequate structure and reward system is evident.

Investigators were involved in the project largely because they feel the project is highly relevant to the university and to the quest for better understanding of how human activity affects the environment. They feel their disciplines each have an important contribution to make toward this end.

The objective of this section of the report is to indicate the current status of the work being done on the systems framework for the overall study. The section also contains indications of the work remaining to be accomplished.

The objective of this research effort was to provide a framework for the evaluations and predictions of the impact of a large scale recreational development on the Gallatin Canyon. This sub-project is based upon the recognition and assumption that the key element of the environmental impact is the activities of man. This ties in directly with the work by the economists. The process consists of an existing semi-primitive area that will experience a projected significant change in the activities of man. Figure 17 is a schematic representative of what the systems group is trying to represent.



The main effort is concentrated in synthesizing the elements of the systems in such a manner as to evaluate the total environmental impact and equally important predict the future impact.

During the fiscal year the systems group has made significant changes and progress. The group consisted of five investigators and a statistical aid who has since joined the project. This group spent the majority of their effort in discussions with individual project members in weekly two hour meetings. These meetings provided a common background for all of the committee members.

The October workshop saw a significant change and redirection in the systems group. The composition of the committee was changed and currently consists of:

- A Statistician
- An Economist
- A Soil Scientist
- An Engineer and
- A Climatologist

This group was charged specifically with the systems analysis of the environmental impact. A second group was also formed and charged with the documentation of how the success and failure of this particular interdisciplinary research effort was achieved. These two groups have had varying success as is pointed out below.

The Systems Group

As previously mentioned the basic efforts of the systems group consist of evaluating existing impact and predicting future impact. Each of these areas is taken separately.

Evaluation

This aspect of the efforts of the group was directed at the evaluations

of the total environmental impact as an input to decision makers. As individuals the investigators have been able to say what the impact on one element of the system has been and might be. However the objective of this work was to combine these individual impacts into a total.

As soon as the problem was approached it became obvious that two significant factors exist in an environmental impact. The first being the measurable change and the second being the importance of that change to the various persons concerned. The first step in developing this measure of impact was to conduct a series of interviews with each project member. These interviews were then used to generate a preliminary list of factors important to the total impact. This preliminary list contains 68 factors. It should be mentioned that the list of factors was developed with no statements as to the importance of each factor.

The steps remaining on the development of such a total index are numerous and as such represent a considerable undertaking. There is no question but what a workable index can be developed. The question is whether or not it would fulfill the need of the decision maker with respect to environmental impact.

One further effort has been undertaken to attempt to present a unified picture of the total environmental impact. This effort has centered around using an impact matrix as developed by the U. S. Geological Survey in circular 645.

As a result of priorities for the usage of limited resources these efforts have been put aside temporarily. This is not to say that the idea of generating such unified measures has been dropped from the minds of the investigators it just appears that this work would be of higher value in

later years.

Prediction

The evaluation of the total environmental impact is important to the decision makers associated with Gallatin Canyon. However, of equal or more importance is a PREDICTION of what the future impact will be. This again brings to mind the singular importance of the activities of man. It is upon these elements that all of the modeling has been based.

The modeling has been separated into several categories. The first segment, which portrays all of the current efforts, is based upon the assumption that the activities of man are the key and in the vast majority of cases "man" will arrive by vehicle. The overall framework has been presented by the economists in their discussions. The vehicles arriving to the canyon are disaggregated to the various activities of man. For the most part these activities are of an indirect character relative to their impact upon the environment. For example logging has a direct impact while skiing has an indirect impact.

The efforts in this area are centered upon the ability of the economic simulation to develop levels for the significant activities of the canyon. For example their simulation will estimate the number of persons skiing in 1985. The question remains as to what the impact of this skiing load is upon the natural environment.

Recognizing the complexity of this problem it was decided to attempt to model only four activities. The success or failure with these four would then indicate the future course of action. These four activities are:

1. Skiing

2. Snowmobiling
3. Fishing and,
4. Trail use.

These activities were selected for their general interest and also for the availability of some excellent work being done to gather data and tie it together by the other project members.

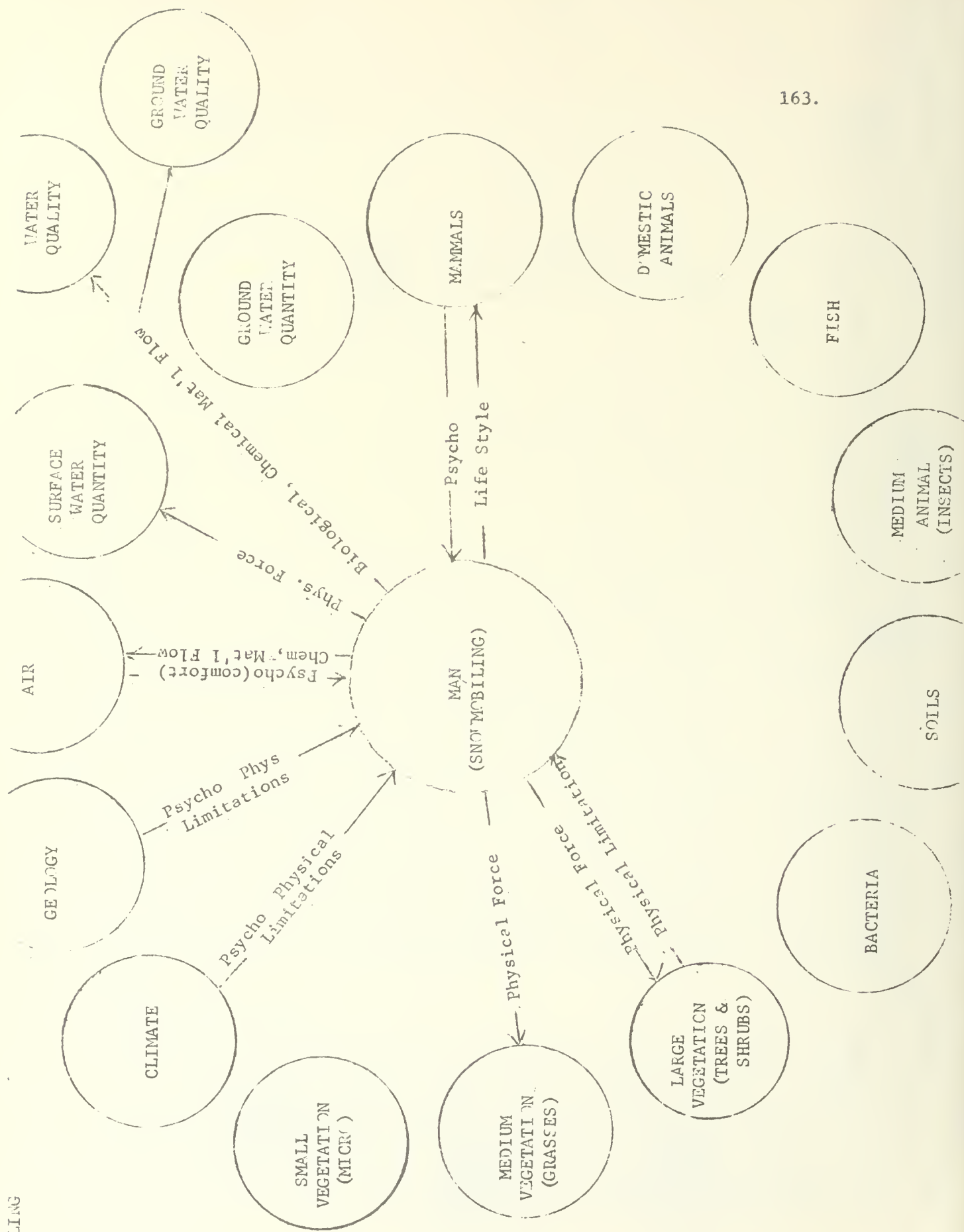
The basic steps used in developing these models are: first the identification of the elements of the natural system (Figure 18 for example), second an identification of the relationships within the system, third an identification of the relationships within the system, third an identification of the natural relations by themselves and lastly an identification of the relationships with the addition of an activity of man. Figure 19 shows a simple version of the model associated with one activity - snowmobiling. The relationships are dependent upon the original definition of the area as given in Figure 17 and attempt to show the first order relationships.

The process of simulation then involves first estimating an activity level from the economic simulation. This is then followed by a simulation of the environmental impact on a first order basis and lastly a measure of the second order impacts (yet to be developed). It should be noted that this process is just reaching the quantification stage and should be ready early 1973.

Summary Systems Group

These efforts at evaluation and prediction are based upon the key assumption that the activities of man are the single most important input and that man arrives by vehicle. Recognizing the exceptions to this assumption it is still felt that the vast majority of cases will be covered by the





simulation models.

There can be no doubt that a significant amount of work remains to be done. However, it is felt that we should have the tools to test various plans of action for the canyon under varying conditions and present a realistic projection of the canyons conditions as a result of these various plans. This information appears to be of great need by those persons (public and private) that will be making the decisions for the canyon area.

The Interdisciplinary Group

This group was formed at the October workshop as an offshoot of previous efforts. The groups charge was to follow the research efforts and document the successes and failures with an eye towards the casual reasons. The group completed two major tasks during the October to March period. First an attitude questionnaire was circulated among the project members in an effort to document the feelings of the investigators. The second effort involved generations of an annotated bibliography of writings related to interdisciplinary research.

The need for this type of documentation was recognized at the October workshop. However, the plans for the continuation of this particular effort are undecided. Again the executive committees selection of priorities for key personnel time will be the deciding factor.

Data Management and Computer Mapping

Both the Data Management and the Computer Mapping functions are basically service functions for the entire project. The Data Management function has done significant programming and data analysis for the following efforts.

Sociology Questionnaires

Travel Questionnaires

Leadership Characteristics

Hunter Questionnaire

Education Questions

Camper Interviews

Economics Disaggregation Model

Interpretations of Soil Data

Data Modification for Mapping

The computer mapping ability was finally developed within the project team. The SYMAP program was made fully operational by the Agriculture Experiment Station and a number of beneficial projects have developed not related to the project. The project developed computer mapping based upon a system of data recording developed for use by all project members. The efforts have resulted in the ability to plot all of the building data gathered by the architects and the social data gathered by the sociologists questionnaire. The ability also exists to combine this data if needed. As for the future efforts the computer mapping has been voted as a non-priority item and as such all efforts will stop until future need arises. Again this was based upon limited resources.

ORGANIZATION OF RESEARCH TEAM

A major accomplishment during the past year has been the greater integration of the various sub-projects of the multi-disciplinary study. The original executive committee (comprised of Charles Bradley, John Wright, Anne Williams, William Lassey, and Robert Emerson) determined that policy decisions for the project should be shared more broadly among the cooperating investigators. Likewise, we realized that conceptualization of the project organization would be more readily accepted by the collaborating investigators if they had input into the process. A site visit by representatives of NSF alerted the team to significant problems in attaining sufficient interdisciplinary collaboration. The executive committee also was advised that the team might obtain a broader perspective if we were to consult with experts from other parts of the country. For these reasons, the executive committee proposed a two day workshop at which time all project scientists participated in reconceptualizing the organization of the project.

The two day workshop was held last October (1971) at the Lone Mountain Guest Ranch, and was attended by all project personnel and four project consultants. The consultants are: Dr. Norman Pearson, a planner from Canada; Dr. Jim Hildreth, an economist and director of the Farm Foundation in Chicago; Dr. William Burch, sociologist from Yale University, and Dr. Marvin Beatty, ecologist from the University of Wisconsin at Madison. This workshop seemed to be a significant turning point in project integration. The team of consultants were enthusiastic and helpful and have provided interesting insights for further research as well as suggestions for generalizing results to other areas.

The October workshop resulted (as anticipated) in a major reorganization of the project administration. The original executive committee, having major responsibility for project organization and effecting the inter-disciplinary research aspects, was dissolved. We concluded that project responsibility should be more evenly distributed among participating investigators and that all project personnel should have some responsibility for effecting the inter-disciplinary ties. With this in mind, we formed four task forces: commercial, residential, leisure or recreation, and public policy and public service. A chairman of each task force was selected and asked to serve on the executive committee. In addition, two other teams were formed to study the inter-disciplinary aspects of the project. These teams included an environmental quality model team and an inter-disciplinary model team. Chairmen from each of these two teams were selected and asked to serve on the executive committee. The principal investigators, together with the chairmen of the task force and model teams, form the current executive committee (see attached diagram). A major consequence of this reorganization seems to have been greater concern and dedication on the part of all investigators to accomplish the inter-disciplinary goals of the research project.

The researchers involved in the Gallatin Canyon Study have had ample opportunity for interpersonal contact of an inter-disciplinary nature. The October workshop has been supplemented by a series of weekly seminars during which time project scientists have presented single discipline seminars describing individual sub-project activity. The purpose of this series of seminars has been to fully acquaint all investigators with single discipline perspectives. Following presentations by the project investigators, the four task force teams each presented an inter-disciplinary seminar. This series

of seminars provided the needed followup and reinforcement of the inter-disciplinary program worked out during the October workshop. The four consultants again visited the research team in March, 1972, during which time project personnel presented an inter-disciplinary seminar to inform the consultants of our more recent activities. The consultant team responded very positively to the inter-disciplinary progress accomplished by the research team. A new series of seminars is now planned, during which time representatives of federal and state agencies will acquaint researchers with agency plans and activities.

Researchers have invested substantially greater time and effort in the project than the project has paid them for. This dedication and time investment on the part of project staff has, more than any other factor, contributed to the inter-disciplinary progress accomplished to date. We intend to maintain our working relationship with the four consultants since they have provided a valuable perspective on the research problem. Present plans are to continue the semi-annual conferences with the consultants and to continue the seminar series. These two activities should help provide the structure needed to re-enforce our inter-disciplinary effort.

In addition to these more formal inter-disciplinary structures, project personnel meet regularly and informally to facilitate inter-disciplinary team work. With the approaching 1972-73 field season, project personnel have been meeting on a fairly regular basis to make plans for the coming field work.

The present organizational structure of the inter-disciplinary research team seems the most satisfactory arrangement for project personnel at this time. However, the project leaders are fully aware that no one organizational

structure is satisfactory for all needs. For this reason, we have agreed to maintain those organizational relationships which facilitate the accomplishment of project goals but to remain somewhat organizationally fluid so that adaptations to changing project needs can be easily accomplished. The major objective of every participating scientist is to facilitate interdisciplinary thinking and problem solving. With this goal in mind, the project scientists have agreed to make whatever adaptations seem necessary to accomplish these goals.

ORGANIZATIONAL STRUCTURE
(Data Collation and Interpretation)

PROJECT MANAGER - EXECUTIVE COMMITTEE

Environmental Quality
Model Team

Joe Caprio
Jerry Nielsen
Don Rose
Ken Tiahrt (Chairman)

Inter-Disciplinary
Model Team

Dick Draper
Bob Emerson (Chairman)
Bill Lassey
Tad Weaver

LAND USE AND/OR ACTIVITIES

COMMERCIAL

1. George Roehmild
(Chairman)
2. Dick Draper
3. Dana Myrick
4. Tom Hanson
5. Joe Caprio
6. John Wright
(Chairman)

RESIDENTIAL

1. Layton Thompson
2. Gene Sharp
3. Bill Bliss
4. Bob Emerson
5. Jim Jezeski
6. Loren Bahls
7. Jerry Nielsen
(Chairman)

LEISURE AND
RECREATION

1. Erhart Hehn
2. Anne Williams
3. Ted Williams
4. Don Rose
5. Charles Bradley
6. Tad Weaver
7. Dick Graham
8. John Montagne
(Chairman)

PUBLIC POLICY AND
PUBLIC SERVICE

1. Harold Picton
2. Mike Malone
3. Ken Tiahrt
4. Bill Lassey
5. Dave Stuart
(Chairman)
6. Charles Bowman
7. Layton Thompson

Executive Committee Member

Some specific concerns have been voiced over the form and content of the terminal report to be submitted at the end of the next year (or in conjunction with a renewal proposal). This will take the form of the present progress report: a smoothly delivered narrative without specific treatment of the individual disciplinary sub-projects outlined in the original proposal. The emphasis will be on the delineation of significant aspects of environmental impact and the interactions of the various factors involved. To achieve completeness, a reasonably detailed report including data summaries of each individual subproject will be appended.

The maximum number of significant environmental variables will be identified. Baseline data and, to the extent possible depending on the stage of development of the resort complex, some trends in environmental social and economic changes will be described. A closely integrated conceptualization of their interrelations and dependencies will be developed.

Based on current achievement and anticipated progress for the coming year, one or more models will be generated to provide some quantitative expressions of relationships between variables and human loadings or capacities as well as some summarizing expressions of environmental impact. The intent is to provide appropriate interpretations of the data obtained locally so that maximum extrapolation to other situations of different place and circumstance may be possible. Maximum predictive capacity will be sought from the conceptual relationships developed.

With regard to delivery of the results of this research, no difficulties are anticipated and maximum use seems assured. The groups having greatest use of the data and the conceptual interpretations developed have been identified to the project participants, and the project identified to the user

groups largely by common gravitation to issues of mutual interest. In all of the significant issues of environmental concern that are of more than purely local interest, the project data already have been extensively utilized (see Figure 19). This is true in the preparation of the environmental impact statements submitted by the U. S. Forest Service concerning Land Trades 2 and 3, that submitted by the Montana Highway Department on the 191 Spur road into the West Fork area, the Wilderness Management - roadless area hearings, and the Gallatin Forest multiuse management hearings. Additionally, these data have been used by the Montana Department of Planning and Economic Development and a consultant planning firm to formulate recommendations for the Gallatin Canyon residents.

PUBLIC POLICY & PUBLIC SERVICE DATA USE RESULTS

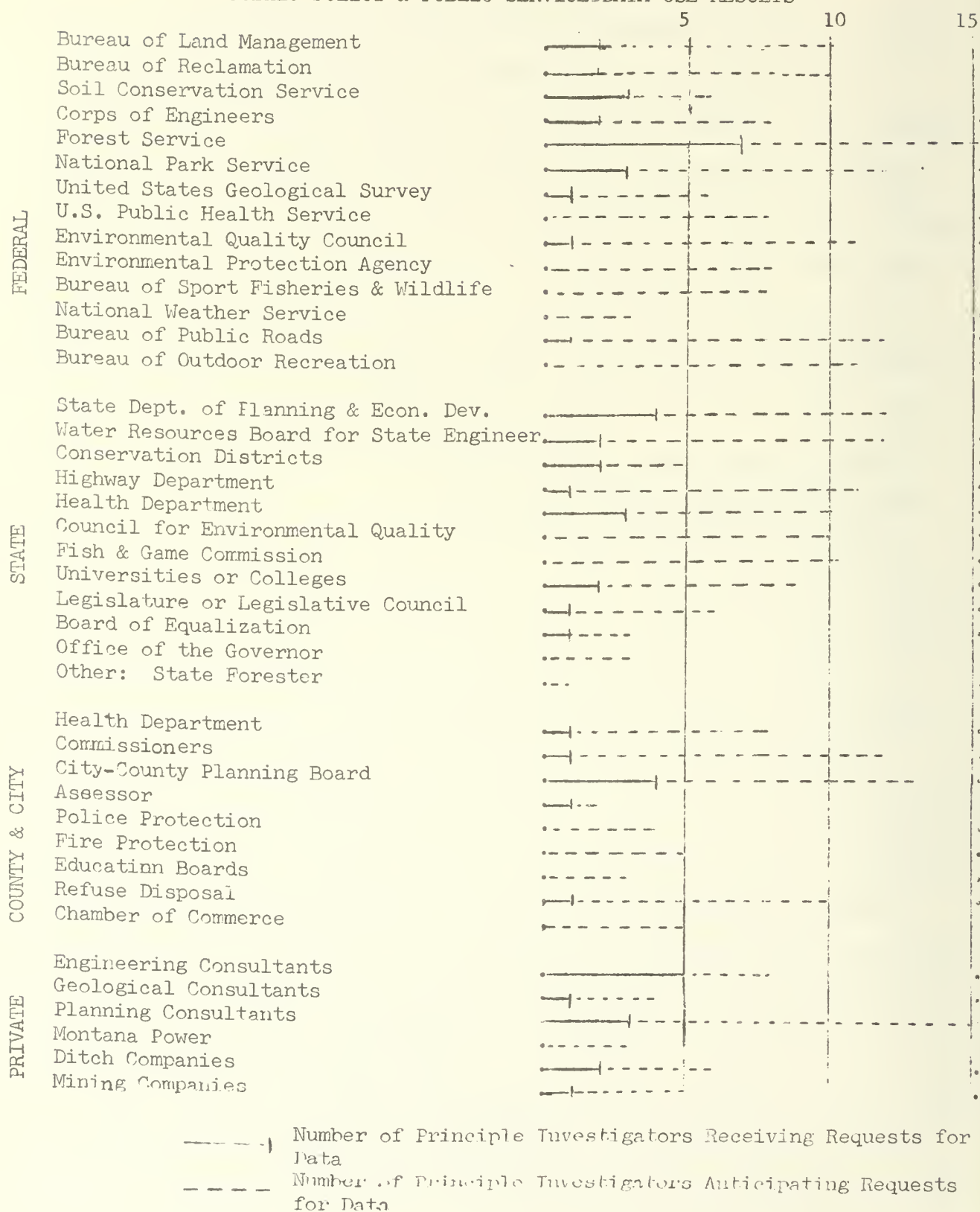


Figure 19.

Summary

The following progress report presents the results of work performed between November, 1970 and March, 1972 and provides an integration of all data obtained since about July 1, 1970 when the preliminary study began.

In our considerations of the overall data and as we have focused on the interdisciplinary aspects of the research, the following accomplishments seem evident:

- (1) A list of pertinent environmental variables has been compiled.
- (2) At least some of the important environmental variables have been identified.
- (3) A wide spectrum of baseline observations and measurements have been recorded.
- (4) Some trends in change due to development activities have been measured.
- (5) Conceptual overviews have been synthesized in terms of inter-relationships between the various disciplinary efforts.
- (6) Some initial efforts have been made to develop models in which quantitative relationships between variables are to be delineated.

To emphasize the interdisciplinary aspects of this research effort, it should be noted that no detailed reports on the individual sub-projects are presented as such. The results obtained in disciplinary sub-project efforts are focused on and applied to more general problems and issues. The narrative considers a variety of environmental impact areas which seemed to the research team to be significant and important. While the overall report covers (1) the progress of work, (2) the plans for the coming year (what

remains to be done on the overall two-year proposal), and (3) the budget; the future plans are included not as a separate section but are interspersed at appropriate points where the pertinent problem areas are discussed.

As is usually the case with broadly conceived research efforts, there were a number of activities that merit some attention where none was included in the original research plans or which warrant greater effort than initially planned. As the result of discussions during the site visit in June, 1971, the studies in the economics area were reshaped and expanded. The geology studies took on added significance with the discovery of the rock glacier in the area where ski lift construction was planned. And while we were cognizant of the lack of a political scientist on the project, some of the pertinent observations in this area were made in connection with the sociological and economic studies.

New arenas for investigation continue to be opened. This seems quite evident in the sociological aspects of the project particularly as related to political science. An analysis of the forces influencing major policy and local situation decisions will be a major contribution to the study. The possibility that the road to be built to the upper village will be further extended over the divide into the Madison drainage could expand the whole scope of the project even if based only on the greatly increased geographical area involved.

Because of the pertinence of the data being gathered on this project to many problems and issues of concern in the intermountain area, we are finding no problems in the delivery of timely information to user groups: governmental agency, industry and concerned citizen organizations. This is not without a price or a problem. For example, the fact that the West Fork-

Lone Mountain area has been designated as an Economic Development Area to qualify it for Department of Transportation funds to support road construction to the upper village and that this research project is probably the principal information resource in the preparation of the required environmental impact statements means that there are influences operating to force the project from its objective data-gathering role into a more active involvement role. Somewhat similar situations are encountered relative to management of wilderness areas, land trade policies, and Forest Service multiuse management programs.

At what point does complete objectivity cease and "interpretive involvement" or "involvement with advocacy" begin? Did those who generated the socially relevant publicly supported research programs visualize the pressures on the research team in terms of public penchant for oversimplification of research results and/or quotations from context?

A more immediate question to be faced relates to the status and disposition of this progress report as a public document. It should be evident at this point that the report and the data on which it is based will be and are now in great demand by both the proponents and the opponents of the various development maneuvers. Some uniform policy relating to availability and distribution is necessary.

Appendix I

The Impact of a Large Recreational Development on a Semi-Primitive Environment: A Case Study

SUMMARY OF INDIVIDUAL RESEARCH PLANS

The following subprojects were undertaken during the first two years of study to:

- I. Measure the existing situation (baselines) before major changes have taken place.
- II. Obtain some indications of developing trends in those situations where change is becoming evident. (These studies have been carried out over the period: July 1, 1970 to June 30, 1972.)

The proposed Phase III will attempt to predict on the basis of these findings, the probable social, economic and ecological consequences of large scale recreation development on similar areas. (July 1, 1972-).

A. Water Quality

- *1. Assessment of the Eutrophication Potential of Resort Development - John C. Wright, Department of Botany and Microbiology (July 1, 1970 to November 1, 1971.)

Purpose: To monitor the biological effects of possible nutrient enhancement of the West Fork and the West Gallatin by effluent from the Big Sky resort sewage treatment plant and other sources. Changes in diatom species diversity will be observed and other bioassay techniques will be used.

* Terminated November 1, 1971 because of loss of Research Associate

Significance: Efficiency of the resort sewage treatment facility and adequacy of design of individual systems will influence the amounts and concentrations of nutrients found in these streams and hence the extent to which algal growth will develop aquatic plant communities are good indicators of water quality.

2. Microbiological and Chemical Characteristics of West Fork and West Gallatin Surface and Ground Waters. D. G. Stuart and J. J. Jezeski, Department of Botany and Microbiology. (July 1, 1970 to date).

Purpose: To follow progressively the physical, chemical, and microbiological changes in the two principal streams and in suitably selected wells and springs being used as domestic water supplies.

Significance: Certain microorganisms and chemicals are very sensitive indicators of pollution. Chemical, physical, and microbiological data are being gathered not only to detect possible pollution but also to provide basic data for other studies concerned with water characteristics and quality. This information is useful in the consideration of public health, eutrophication and stream productivity problems.

3. Aquatic Invertebrates in the West Fork and the West Gallatin River - Effects of Human Ingress into the Area. George Roemhild, Department of Zoology and Entomology. (July 1, 1970 to date).

Purpose: To study the communities of certain organisms both as to diversity and maximum populations in relation to water quality characteristics and possible changes induced by pollution at various concentrations.

Significance: Induced changes in biota can be indicative of pollution. These organisms are also food for trout. They are sensitive to changes in water quality and are a good index to the capability of the

stream to support fish and of possible exposures to lethal levels of toxic materials.

B. Fish

1. Fisherman Activities and Expenditures on the West Gallatin River. Richard J. Graham, Montana Cooperative Fisheries Unit. (July 1, 1970 to date).

Purpose: To provide baseline information on the fishery resource (fisherman use, fish harvest, and fisherman expenditures) prior to the full development of the recreational complex.

Significance: Proposed recreational developments are expected to greatly increase fishing pressure and may alter the physical, chemical and biological characteristics of the river. Trout stand at the apex of the food chain; hence trout populations are sensitive indicators of environmental perturbations. Such alterations will also probably influence the response of the fisherman to the environment (i.e. his satisfaction). This information will not only aid in assessing the overall impact of the development on the community and the people, but it will aid in the management of this resource.

C. Game

1. The Gallatin Elk Herd: The Effect of Development on this Basic Resource and the Economics of its Use. Harold D. Picton, Department of Zoology and Entomology (July 1, 1971 to date).

Purpose: To obtain information on the effect of increased human activity and contact on the summer and fall range of the resident elk herd and on the migration routes of the wintering herd. The effects of satellite developments and logging activities should be assessed separately

from the primary resort activities.

Significance: The elk herd behavior and fate is an indicator of man's impact on the ecology of the area and, as such, provides another means of monitoring the man-environment relationship. The management program of this wildlife-recreation resource is critical and a subject of intense controversy which have affected the policies of both State and Federal agencies.

D. Physical Environmental Factors

1. The Goemetry, Origin, and Movement of Alpine Mass Wasting Features in the Lone Mountain-Spanish Peaks Area, West Fork Basin. John Montagne, Department of Earth Science. (July 1, 1970 to date).

Purpose: To obtain information concerning the surficial geology features of the area and focus on the rock glacier located on the east slope of Lone Mountain to determine possible impacts of human activity on this area.

Significance: The bedrock geology is the mineral basis for soil development and chemical quality of water. It also holds the key to certain construction problems, ground water supply and earthquake potential.

2. Soil Mapping and Interpretations for Resource Planning in the Gallatin Canyon. G. A Nielsen, Department of Plant and Soil Science (July 1, 1970 to date)

Purpose: To provide soil classification and mapping as rational bases for alternate land use plans and to reconcile soil limitations with increased construction costs in marginal land use areas.

Significance: Soil is the basis for all terrestrial plant life and hence indirectly for all animal life. Like geology it also holds the key to the effective use of land and water. Because soil type and structure

provides constraints on construction and development, there are strong economic and human behavioral implications in these studies.

3. Air Quality Studies in the West Fork-Gallatin Canyon Area. E. L. Sharp. Department of Botany and Microbiology (July 1, 1970 to date).

Purpose: To obtain data on changes in air quality prior to and during the development of a major recreational facility as a function of construction activity, internal combustion engine exhaust and domicile heating plants.

Significance: Except during slash-burning, the air quality of West Fork is probably quite high. Two large recreational centers in West Fork are certain to have some influence on air quality, especially during winter. How much?

4. Climate of the West Fork-Lone Mountain Area. Joseph M. Caprio, Department of Plant and Soil Science. (July 1, 1971 to date).

Purpose: To provide some detailed information on weather conditions and the topo-climate of the area as an aid in developing estimates of recreational activity potentials and some of the constraints in planning.

Significance: The probabilities of various extremes of weather occurrences have a decisive impact on the activities of humans and their decisions to live or temporarily reside in an area and/or participate in recreational activity.

5. Hydrology of the West Fork Area. Theodore T. Williams, Department of Civil Engineering; Thomas L. Hanson, Department of Agricultural Engineering. (July 1, 1971 to date).

Purpose: To determine the changes in ground water quantities and surface runoff as the development progresses and water uses become more extensive.

Significance: The estimation of surface and ground water resources in the West Fork area is basic to investigations relating to water quality, fisheries, and recreation.

E. Recreational Land Use

1. Effect of Campsite Use on the Environmental Quality of the Gallatin Canyon. Erhardt R. Hehn, Department of Plant and Soil Science (July 1, 1971 to date).

Purpose: To determine the effects and consequences of human activity in campgrounds under different intensities of use. Changes in vegetation, soil characteristics, and water quality will be monitored as a function of use patterns.

Significance: Increasing human traffic destroys plant species in campsites, thus contributing to erosion, stream pollution, mud, and dust. The effects of man's presence on the ecology of such areas must be quantitized as a first step in developing preventive measures. Camper satisfactions are related not only to physical conditions but to certain behavioral considerations. Information gathered in this study will be applied to the selection and design of campsites and the management programs of campgrounds.

2. Vegetation Studies - T. Weaver, Department of Botany and Microbiology (July 1, 1971 to date).

Purpose: To record vegetation patterns in the Spanish Peaks Wilderness area and in neighboring West Fork-Gallatin Canyon localities. To determine changes in understory vegetation in several forest types along trails and in primitive campgrounds.

Significance: Relating vegetation patterns to intensity and type of usage will provide data on ecological effects of these activities and

establish some bases for management programs.

F. Social Studies

1. Community and Other Social Factors in the Gallatin Canyon. Anne S. Williams, W. R. Lassey, and C. R. Draper, Center for Planning and Development, and W. D. Bliss, Department of Psychology. (July 1, 1970 to date).

Purpose: To study selected aspects of the Gallatin Canyon community including: (1) organizational patterns and activities; (2) responses to planning and zoning efforts; (3) leadership behavior patterns (4) changes in the Gallatin Canyon population characteristics; (5) changes in social services; (6) variations in leisure time activities on the basis of new recreational opportunities; (7) the political influences and activities that generate policies or decisions in the Canyon.

Significance: This information is critical in understanding the Canyon community and how people respond to the forces generated by a large recreational development.

2. History of the Gallatin Canyon - M. P. Malone, Department of History (July 1, 1971 to date).

Purpose: To explain the present situation in the Gallatin Canyon by analyzing the course of human history in regard to the economic and other motives that stimulated settlement; demographic, ethnic, and economic patterns in the settlement process; social, political, and other attitudes characteristic of Canyon residents.

Significance: To provide a historical base for understanding and interpreting current social, political and economic activities in the Canyon.

3. Study of the Gallatin Canyon Water Rights. C. C. Bowman and T. L. Hanson, Department of Agricultural Engineering (July , 1971 to date).

Purpose: To develop a current inventory of the water rights and water use on the West Gallatin River and its tributaries.

Significance: Large scale developments in the area could restrict availability of water and jeopardize present water users. It is necessary to guard against over-taxation of water resources in the West Gallatin Canyon area. The recent Supreme Court ruling on 1897 Forest Service ownership water rights makes a complete inventory study very critical.

- **4. Educational Structure - L. Denike, J. Mikesell (July 1, 1970 - June 30, 1971)

Purpose: In addition to the necessary "baseline", this study will obtain resident attitudes and desires concerning the local educational program and facilities.

Significance: To evaluate the probable use of educational facilities by new Canyon residents and the contribution these residents make to the development of the facilities. Also attitudes change with time. What changes will come here? (Data collection completed).

- **5. Archaeological Sites of West Fork - L. Lahren (July 1, 1970-June 30, 1971)

Purpose: To explore archaeological sites that will probably be disturbed (or destroyed) by construction of the resort complex. Later on, we hope to secure more funds to explore other archaeological sites in the Canyon.

Significance: To recover and preserve Indian artifacts of scientific and historic importance. This should also be of historic

** - Active only during preliminary proposal period. Not included in regular grant beginning July 1, 1971.

importance. This should also be of historic interest to local residents and visitors to the area. (Due to limited funding, selected sites were not excavated; other funding sources are being explored, but none have been located).

****6. Inventory of Building Types and Facilities - W. McCroskey
(July 1, 1970 - June 30, 1971)**

Purpose: To catalogue all building types and facilities in the Canyon, to trace the growth patterns over past years and to project future growth patterns.

Significance: The study will be useful: (1) to determine future housing and other building needs in the Canyon, (2) to measure changes in building quality, (3) to measure the effect of the resort development on construction activity and changes in building types and (4) to determine how land is presently being used in order to see how use changes over time. (Data collection completed)

G. Economic Studies

**1. Land Ownership, Land Use, and Land Prices - L. S. Thompson,
Department of Agricultural Economics and Economics.
(July 1, 1970 to date)**

Purpose: To measure changes in land ownership and property values as a basis for isolating the effects of the Big Sky project on these characteristics. Also to relate land values to changes in tax base.

Significance: Land values generally change in advance of changes in land use, and the effects of Big Sky activities must be closely followed to determine the effects on the local situation. Increases in assessed valuations will be a substantial factor in the cost-benefits analysis.

****Active only during preliminary proposal period. Not included in regular grant beginning July 1, 1971.**

2. Travel Study - D. K. Rose, Department of Agricultural Economics and Economics. (July 1, 1970 to date).

Purpose: To estimate the level of tourist traffic (peaks and distribution patterns) and the economic value of tourism trade in the Canyon and surrounding region.

Significance: The contribution of these data to the final determination of cost-benefit ratios should be clearly evident. These are some of the operational primary inputs upon which the business multipliers are dependent.

3. Impact on Business Activity. D. H. Myrick, Department of Agricultural Economics and Economics.

Purpose: To continue measurements of business activity as the Big Sky complex develops. This will include surveys of businesses in Gallatin County, income and taxes and studies on commercial travel services and indicators of business stimuli associated with the resort area growth.

Significance: These data will provide the bases for estimating the degree of business stimulation in the community. This information is necessary to develop the proper multipliers used in evaluating the overall impact of the primary income and investments in the community. Also, it is vital for the overall cost-benefit analysis.

E. Data Storage and Management-Systems Analysis

1. Information Center - C. R. Emerson, Department of Industrial and Management Engineering (July 1, 1970 to date)

Purpose: To develop a central agency to receive data from all projects and computerize it for storage and retrieval.

Significance: To help integrate the many different aspects involved in this study.

2. Spatial Documentation - C. R. Emerson, Department of Industrial and Management Engineering (July 1, 1970 to date)

Purpose: To develop the capability of using the computer to produce and reproduce maps from that portion of the data which lends itself to mapping.

Significance: Speed and efficiency of visually recording and using the data stored by the computer.

3. Systems Analysis - C. R. Emerson, J. C. Wright, Anne S. Williams, D. V. Rose, G. A. Nielsen. (July 1, 1971 to date)

Purpose: To provide a systems framework for the total Gallatin study to identify significant elements in the study and describe some of the interactions between these elements. To determine the feasibility of constructing models (conceptual and/or mathematical, descriptive and/or predictive) for major elements of the study. Develop those models which seem most feasible.

Significance: To provide widest applicability of our findings and reduce the mass of data to forms of maximum utility for users, the processes of identification and enumeration of significant elements and the development of a conceptual overview of their importance and interactions prior to a quantitative predictive model must be carried out.



Appendix III

A. Questionnaire with response totals - 27 respondents

1. Were you prompted to submit a project proposal by Chet Huntley's offer of \$15,000?

Definitely Yes	<u>2</u>
Yes	<u>5</u>
Don't Know	<u>2</u>
No	<u>9</u>
Definitely No	<u>7</u>

2. Were you prompted to submit a project proposal by Dr. R. Huffman's letter which stated that the university as a unit would submit a funding request?

Definitely yes	<u>3</u>
Yes	<u>9</u>
Don't know	<u>2</u>
No	<u>7</u>
Definitely No	<u>6</u>

3. Were you prompted to submit a project proposal by:
(respondents were asked to check all applicable categories, noting priority of influence).

	<u>Priority of Influence</u>	<u>Number Responding Priority Influence</u>
a. Your Department Head	1.	2
	2.	1
	3.	0
	4.	3
	x.	1
b. Other Staff Members	1.	1
	2.	2
	3.	2
	4.	0
	5.	1
	x.	2
c. A Desire to be Involved	1.	6
	2.	3
	3.	3
	4.	0
	x.	5

3. Continued Number Respondents

	<u>Priority of Influence</u>	<u>Number Respondents</u> <u>Priority Influence</u>
d. Previous Knowledge of the Potential Problems	1. 0 2. 1 3. 3 4. 2 x. 2	
e. A Disciplinary background you felt was necessary to the study	1. 6 2. 5 3. 2 4. 2 x. 8	
f. You were asked by a person outside your department	1. 1 2. 3 6. 1 x. 2	
Other:	6. 1 7. 1 x. 1	

4. When you first joined the project was the main emphasis on your own research effort?

Definitely Yes	<u>7</u>
Yes	<u>10</u>
Don't Know	<u>1</u>
No	<u>4</u>
Definitely No	<u>5</u>

5. When you first joined the Gallatin Canyon study did you want a completely independent budget?

Definitely Yes	<u>3</u>
Yes	<u>12</u>
Don't Know	<u>6</u>
No	<u>6</u>
Definitely No	<u>0</u>

6. Would you have joined the Gallatin Canyon study if your budget had been part of a larger pool and you did not have freedom of decision about allocation of funds assigned to you?

Definitely Yes	<u>2</u>
Yes	<u>13</u>
Don't Know	<u>8</u>
No	<u>3</u>
Definitely No	<u>1</u>

7. When you first joined the Gallatin Canyon study was your personal bias for or against "Big Sky"?

For	<u>9</u>
Neutral	<u>12</u>
Against	<u>5</u>

8. Do you feel you had an honest and complete picture of what "Big Sky" was or was not going to do and become?

Definitely Yes	<u>1</u>
Yes	<u>12</u>
Don't Know	<u>3</u>
No	<u>8</u>
Definitely No	<u>3</u>

9. Is this your first experience in working with other disciplines on a major research project?

Yes	<u>12</u>
No	<u>15</u>

10. Did you have other independent research under way at the time you submitted a sub-project for the Gallatin Canyon study?

Yes	<u>24</u>
No	<u>3</u>

11. Did you have other inter-disciplinary research under way at the time you submitted your sub-project?

Yes	<u>11</u>
No	<u>16</u>

12. Do you consider inter-disciplinary research as a less important professional activity when compared to independent research in your disciplinary specialty?

Definitely Yes	<u>0</u>
Yes	<u>5</u>
Don't Know	<u>2</u>
No	<u>13</u>
Definitely No	<u>6</u>

13. Do you foresee any professional advancement as a result of your involvement in the Gallatin Canyon Study?

Definitely Yes	<u>3</u>
Yes	<u>8</u>
Don't Know	<u>4</u>
No	<u>11</u>
Definitely No	<u>1</u>

14. Do you foresee any advancement at Montana State University as a result of your involvement on the Gallatin Canyon Study?

Definitely Yes	<u>2</u>
Yes	<u>7</u>
Don't Know	<u>10</u>
No	<u>6</u>
Definitely No	<u>2</u>

15. Does the possible minimum professional recognition for your efforts at inter-disciplinary research bother you?

Definitely Yes	<u>3</u>
Yes	<u>5</u>
Don't Know	<u>2</u>
No	<u>15</u>
Definitely No	<u>2</u>

16. Were you bothered by the effort required to coordinate with investigators outside of your own research effort?

Definitely bothered	<u>0</u>
Bothered but did it anyhow	<u>12</u>
Bothered slightly	<u>3</u>
Don't Know	<u>1</u>
Not Bothered	<u>9</u>
Definitely not Bothered	<u>2</u>

17. Does the possible lack of university recognition of your efforts bother you?

Definitely Yes	<u>5</u>
Yes	<u>7</u>
Don't Know	<u>3</u>
No	<u>10</u>
Definitely No	<u>2</u>

18. Was the major motivation for your involvement the potential summer salary?

Definitely Yes	<u>1</u>
Yes	<u>4</u>
Don't Know	<u>1</u>
No	<u>10</u>
Definitely No	<u>11</u>

19. If we were starting all over would you still become involved in the Gallatin Canyon Study?

Definitely Yes	<u>7</u>
Yes	<u>14</u>
Don't Know	<u>4</u>
No	<u>2</u>
Definitely No	<u>0</u>

Please Classify yourself.

<u>5</u>	Social Scientists
<u>4</u>	Earth and Air Scientists
<u>4</u>	Engineer or Architect
<u>11</u>	Biological Scientists
<u>3</u>	Economist
<u>1</u>	Other

B. Suggested Changes in the Project

Probably, but I doubt whether it would have affected the course of events - people just have to learn how to do their kind of research slowly, whatever the organizational structure is. I mean they have to slowly learn to do their kind of research.

Be more specific in the definition of goals. Develop a schedule for the accomplishment of objectives.

We could have had more cooperation and common effort than we had; I think we are beginning to get there now.

Determine needs of project and then solicit the research team.

Only, I suppose, to adjust initially to NSF guidelines - if that's not impossible.

Have a small inter-disciplinary group define the major problems, their inter-relationship and then budget around the problems and try to find the people.

In selection of the original projects to be needed in the study, more screening should be done to weed out those investigators who are "loners".

Clear understanding of "who" is responsible for "what". The project should have started with a list of objectives and priorities - and staff added to fill these needs. Although, I question that this could have been done in this or any other University.

I don't know. For an inter-disciplinary study, things worked pretty well.

B. Continued

Label the research multi-disciplinary and let it go at that - that's all it is and ever will be with the number of sub-projects involved and the present leadership. The size of the organization is too unwieldy for "inter-disciplinary" research. Really top-flight men.

I'm not sure the recreation, social, etc. breakdown is perfect. I like the Tahoe model: I think it fits things together better and leads to better integration.

Not Now.

It would have been better to have started with our present executives. This project is taking a lot more of my time than planned. Donation of considerable free time during the academic year is wearing thin. It would be desirable either to gain some relief from other duties or extra time compensation.

We could probably use a stronger management than we had formerly. I think we are going in that direction and this is good (in my opinion).

Knowing how the project was to be organized (leisure, commercial, etc.) we should have started with these groups as the project leaders for funding and direction through them.

Strong central leader and authority smaller group and more responsibilities per person.

Possibly a smaller number of projects organized on a factor basis would have worked better.

Major revision of the starting procedure. Would want better coordination and understanding immediately after individual proposals submitted. At this screening definite objectives should have been set.

Would like to see the project coordinator as an investigator and with free time (salary replacement) to manage and integrate the work. Would prefer a somewhat smaller group with more time allocation for each to work at their inter-disciplinary design and conduct of studies.

C. General Comments

My main concern: when we first started the project each individual investigator stated what part of his time he was willing to and able to put into the project. The administrators of the project have increased the time commitments of the individual investigators without the consent of the investigators. I receive no salary from the Big Sky project - part of my salary is from experiment station and the station OK'd my original proposal. They did not OK the large extra amount of time which has become necessary

C. Continued

because of the reorganization. It seems to me that the guiding people in the Big Sky project do not realize that many of the investigators have other research commitments which were made previously. I would like to see this discussed at an open meeting sometime, perhaps with Asleson present. Perhaps with my Academic Dean present too.

I am concerned that the organization presently is not adequately evaluating the anticipated products of the project to assure that they can be applied to national needs.

We should have had seminars sooner and we should definitely organize along the lines of the seminar groups.

Because this a relatively novel effort at MSU, we should have specifically requested funds to study the process through which we went as a test of "how to approach inter-disciplinary studies." Under present structure I am not sure we will learn as much as we otherwise might have.

Too many investigators in the administrative positions had already worked 1 to 1-1/2 years in the area and had their minds made up before other areas were funded for study. This made a very poor arrangement for meaningful input from new investigators.

The project is going good now. We had the wrong man as director the first 1-1/2 years.

Universities have great difficulty in holding an effective short-term task force, because of personnel assignment inflexibility, physical dispersion of people and professional loyalties, this type of effort may not be a University's cup-of-tea.

None at present.

Are required to head the project, not just good administrators but well-rounded, highly qualified environmental scientists. The goal of interdisciplinary research seems more highly motivated by financial survival rather than professional conscience in this case and as such cannot be achieved without the unreserved cooperation of all investigators.

I foresee a great problem in writing a composite and interrelated report.

Going better and getting clearer all the time.



